THE IRON AGE

THE NATIONAL METALWORKING WEEKLY November 9, 1950

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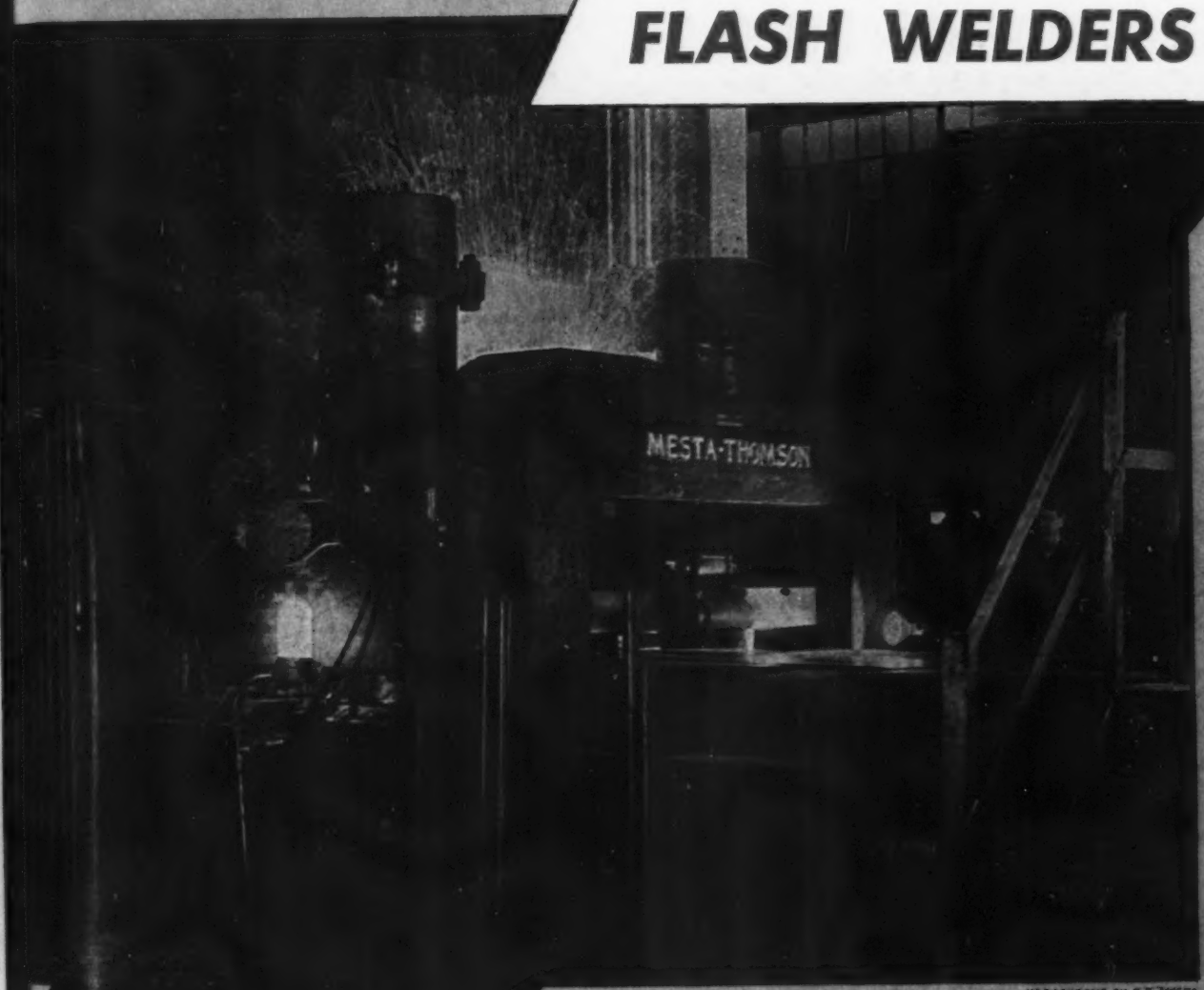
Increase
Cold Mill Production with... MESTA-THOMSON FLASH WELDERS



Mesta-Thomson Flash Welder installed in a Mesta High-Speed Continuous Pickling Line

KODACHROME BY E.D. MESTA

MESTA MACHINE COMPANY
PITTSBURGH, PA.
Designers and Builders of Complete Steel Plants

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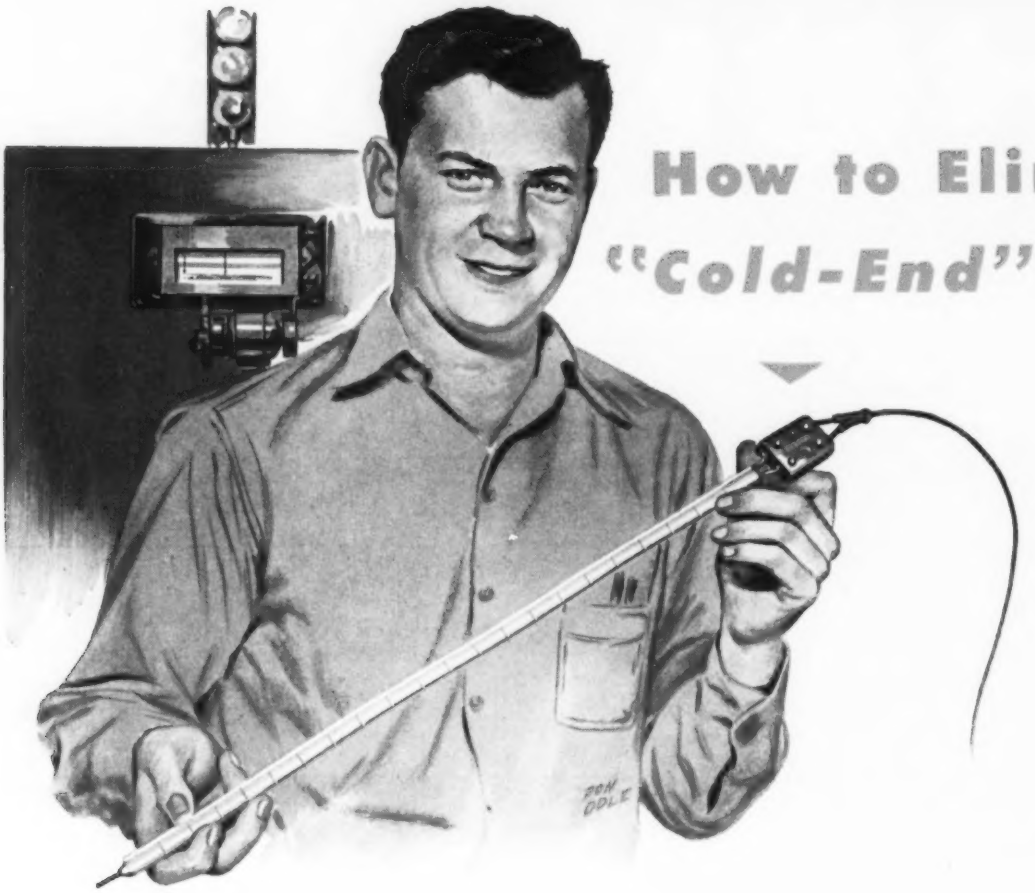


How to Eliminate "Cold-End" Errors

Use Chromel*-Alumel *Extension Leads* with your Chromel-Alumel Thermocouples

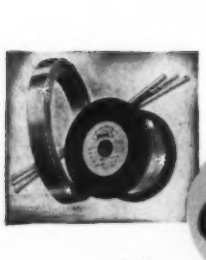
Modern pyrometers, within themselves, leave little to be desired as far as accuracy of temperature measurement is concerned. They're precision built instruments . . . delicately balanced . . . equipped with automatic cold-end compensators . . . designed and engineered throughout to give you the fine degree of accuracy you need. And, on 3 out of every 4 heat treating installations, these accurate meters are calibrated for CHROMEL-ALUMEL thermocouples . . . durable, dependable, sensitive couples unconditionally guaranteed to register true temperature—E.M.F. values within extremely close specified limits.

Yet, in spite of all the fine accuracy built into these meters and couples, uncontrollable "cold-end" errors will frequently occur when so-called "compensating" lead wires are used. Here's why . . .

As you know, when wires of different composition are joined together, they form a thermo-electric junction. In the case of "compensating" leads connected to your Chromel-Alumel couples, these junctions are located just outside the furnace and unprotected from heat. Now, as these terminals get hot . . . *and they often get very hot* . . . or when one junction gets hotter than the other, the opposing E.M.F.'s they generate tend to become more and more unequal. And this variable inequality is inevitably reflected by serious plus or minus errors registered by your meter.

How to eliminate this common cause of "cold-end" errors? Simple! Use CHROMEL-ALUMEL EXTENSION LEADS with your CHROMEL-ALUMEL thermocouples. For only by using these wires of identical composition can you be sure of getting the full benefits of accuracy offered by today's improved pyrometers. Our Catalog 59-R tells the complete technical story . . . want a copy?

CHROMEL-ALUMEL couples and leads are available through your instrument manufacturer or pyrometer service company . . . ask for them by name!



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**the original nickel-chromium resistance alloy that first made electrical heating practical*

Tool Steel Topics

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

In the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

LEHIGH H PRODUCES 20,000 PARTS DAILY FOR VENETIAN BLINDS

This seven-stage progressive die is made entirely of Lehigh H. It blanks, embosses, and forms venetian blind parts from .032-in. cold-rolled steel. Hardened to Rockwell C-61, it produces about 20,000 pieces daily.

Photo courtesy: A. F. & G. Tool & Die Co., Inc., Baltimore, Md.

This popular high-carbon, high-chromium steel wears ...and wears... and wears.

It's air-hardening, of course. Veteran toolmakers like the way it holds the closest dimensions during heat-treatment. It's deep-hardening, too; and has high compressive strength. If there ever was a tool steel made for maximum production, it's Lehigh H!

Detective Work Needed When Dies Fail

Dies that are made from the right tool steel and properly heat-treated will stand a lot of abuse. But there are limits. Just the other day, for example, we saw a broken die made from a reliable grade of tool steel. It was made for blanking pieces from 18-gage sheet steel, and the clearances were carefully designed accordingly.

When the die was delivered to the shop, an over-anxious operator couldn't wait to try it out. His sheet steel wasn't available, but he found a pile of light steel plate and started banging out sample pieces. Result: a broken die.

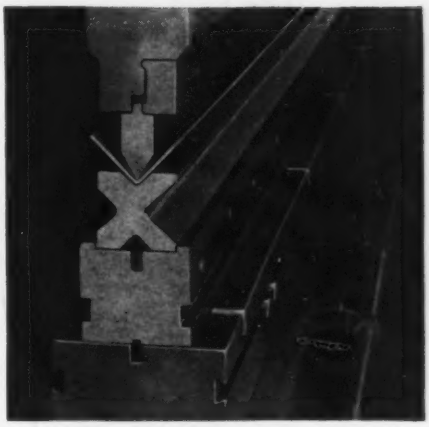
In a case like this, the first impulse is to point an accusing finger at the tool steel. Experience shows, however, that the fault nearly always lies in the design, heat-treatment, grinding, or in the use of the tool or die.

Our Tool Steel Engineer Says:

Fresh water is all right for chasers, but don't use it for quenching tools.

Fresh water, regardless of its source, contains dissolved gases which make it unsuitable for the quenching of tools. When tools are quenched in fresh water, gas is liberated at the surface of the tool. Gas pockets thus formed may prevent contact between tool and water to an extent that soft spots are produced as a result of ineffective quenching. Soft spots are undesirable, not only because of their low hardness, but because a quench which produces soft spots is also likely to cause cracking of the tools.

Soft spots, and tool cracking associated with soft spots, can be avoided by quenching in water which has been boiled to remove dissolved gases. If the water cannot be boiled, quench a large amount of hot "dummy" material to expel the gases. It is preferable to use a 10 pct brine solution instead of water as a further precaution against soft spots. Care should also be taken to expel dissolved gases from the brine solution before use.



Typical brake die assembled in a press brake. Bethlehem Brake Die Steel is heat-treated, ready to use, needs no further hardening. It gives long wear, has high tensile strength and plenty of shock-resistance.

Sheet-Metal Brakes Call for Special Brake-Die Steel

Among those people who have sheet-metal brakes in their shops are a few who are accustomed to using just any old steel for their brake dies. They find that they can get a cheap steel to use for this purpose and they see no reason for paying a higher price.

In the long run, these folks will pay a fancy price for the "cheap" steel by the time they get through fussing around with it, doctoring up the ordinary steel to take out the twists and bends. Shop overhead and costs run high these days.

Bethlehem Brake Die Steel is really tops for its special-purpose job.

We stock this steel in standard sizes in our Mill Depot. It's carefully heat-treated, oil-quenched and tempered, then straightened and stress-relief annealed to prevent warping when it's machined by the die-maker. It's engineered to machine easily and to give long wear in service.

The maker of brake dies can machine this fine steel to accurate contour and not have to worry about whether or not it's going to *stay* straight. It's economical to make up into dies because it's heat-treated, ready for use without any further hardening.

Like to know more about it? Write for Folder 560, addressing our nearest sales office or our Publications Department at Bethlehem, Pa.

Bethlehem ULTRASONIC TESTED **Tool Steel**

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THE IRON AGE

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November 9, 1950 • • • Vol. 166, No. 19

Special Article

Two lathes developed in Germany and soon to be built in this country operate at rates far faster than current American practice. A trepanning lathe bores holes in forgings at rates up to 41 ft per hr. A rough turning lathe can remove metal at rates up to 2000 lb per hr.—p. 85.

Issue Highlights

New tests for drawing quality come closer to evaluating it than those now used. Uniform elongation is much more important than total elongation. Microstructures, inclusions and alloy residuals play a big part.—p. 88.

Packing hot water heaters in corrugated paperboard boxes instead of wooden crates reduces manufacturer's packaging costs by 20 pct, damage claims by over 80 pct. —p. 93.

Reserve Mining Co., owned by Republic and Armco, will revamp the old Mesabi Iron Co. plant at Babbitt, Minn., for production of 300,000 tons of ore concentrate a year. This is the biggest boost in the taconite program since Oliver Mining Co. decided to build its half million ton plant at Virginia, Minn.—p. 107.

Henry J. Kaiser believes the U. S. needs 30 million tons more steel capacity as soon as it can be built. He says it should be built even if it means temporary controls on the economy, that it could be done in 2 or 3 years.—p. 110.

Higher capacity and sustained near-capacity output are reflected in record earnings by the steel industry for the first three quarters. However, third quarter earnings were 7.3 pct less than second quarter earnings.—p. 111.

Business is booming for contract tool and die shops, but a manpower shortage is giving them plenty of grief. The Manpower Div. has warned them against pinning their hopes on personnel of draft age.—p. 113.

Personnel staffing the Iron and Steel Div. of NPA have already been selected and are at work. However, many of them have yet to be sworn into their posts. Debate over dollar-a-year status is causing delay.—p. 114.

Coming Next Week

Intelligent use of public relations can build worker respect for a company. This often pays off during wage negotiations. It does little good for a company to offer fair terms if the community and workers don't believe they are fair.

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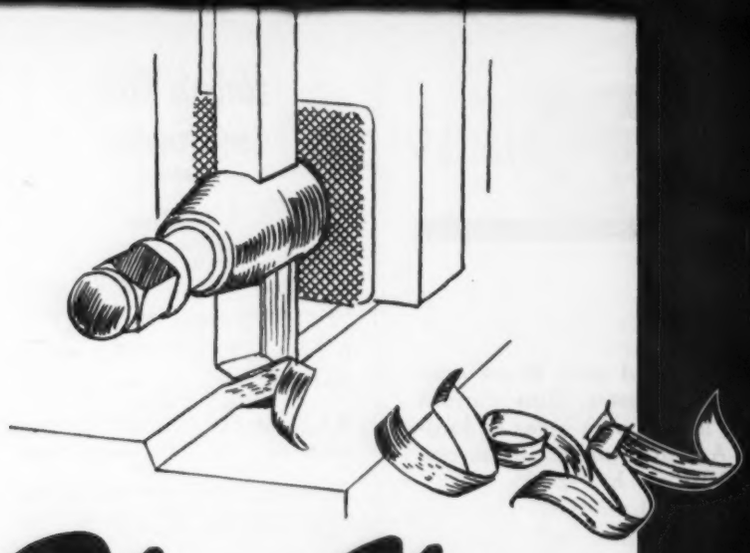


Blue Chips

Cincinnati Shapers cut blue chips that are profitable chips. Blue chips come from tough die steels that present unusually tough machining problems.

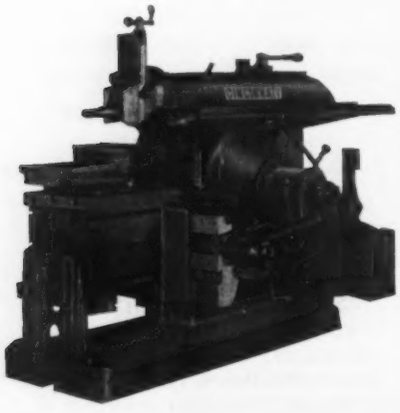
The machine must be accurate in performance, must deliver unusual power at the cutting tool, and must have great stamina. On these things hinges the profitable handling of these tough steels.

Cincinnati Shapers, with their outstanding performance, are found in large numbers in tool and die plants everywhere.

Our representative in your neighborhood will gladly consult with you on increasing accuracy and profit in your shop.

Our Engineering Department is at your service. Ask their advice on your shaping problems.

Write for Catalog N-3



• THREE TIMES AS TOUGH . . .
By test, die steels are often three times as tough as mild steel—and machining demands are correspondingly more severe.

THE CINCINNATI SHAPER CO.
CINCINNATI 25, OHIO U.S.A.
SHAPERS · SHEARS · BRAKES

Editorial

INDUSTRY VIEWPOINTS

Don't Sell Yourself Short

IF, in 1900, a man had imagined out loud one fifth of what we Americans have now he would have been locked up. Yet we have too many today who would sell America short.

We were at the height of everything in 1929. Then came the depression 30's. We would never get out of it. Some people talked of the end of our system. We would have a lower standard of living. Statisticians freely predicted a stabilized (dead level) population by 1970.

So serious and so deep were the mental wounds during the depression that many people have not yet recovered from them. Some of the depression-shy people are in our top level executive class today.

There are explanations why we have not had a postwar depression—yet. Some are good. We do have inflation. We are following the will o' the wisp—security. People don't work as hard as they used to. We will pay the bill some day.

But we do have more and better things. Business has defied the know-it-alls who have dealt only in negative thinking. Labor has gained 15 to 20 pct or more in real wages in 10 years. Baby mortality is lower. Older people live longer. Disease has been given a terrific setback.

We have a net increase of close to 20 million people in the past 10 years. But 32 million have been born in that time. They are the important ones. They will consume, use, destroy and make many times more in their lifetime than did their parents.

Some depression-wise executives have acted sanely in the past several years. Maybe they did prevent a new panic. Maybe some went too far in reverting to the static thoughts of the 30's. It is good that those with drive, push and confidence in the average American paid little heed to calamity howlers.

Now we have a new fear—that defense costs and production will keep our civilian economy down too much. It will smack it hard but not out. We must pay for our freedom.

We are expanding. Steel expands. Aluminum expands. People build homes. Public utility oldsters are groggy looking at what they are doing—and will do.

There are $35 billion worth of E Bonds in the hands of our people. Larger families are here. Marriage rates are up again. That means more work, more consumption.

There is something spiritual in each American who works, fights, recovers and goes ahead. It is personal initiative. The right to reward for work and the refusal to be licked. It is the heritage of the pioneers—and it hasn't run out yet.

Tom C. Campbell

Editor

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DRAVO HEATERS.

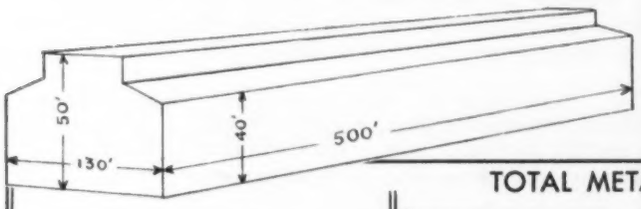
AS WELL AS MONEY.... FUEL.

Heating system steel needs *can* be slashed from 50% to 70% for the representative open-space industrial structure shown below . . . by using the direct-fired warm air heating method with Dravo "Counterflo" Heaters! This conservation, of vital importance today, adds another to the long list of economies in money, fuel and labor effected by this heating method.

The chart below gives the detailed comparative story. Every system is equivalent in Btu output. Steel requirements for the 13 methods have been carefully and conservatively calculated.

It will be noted that Dravo Heaters not only take LESS steel in each fuel classification . . . but that the HIGHEST steel requirement in a Dravo installation is almost 50% less than the LOWEST steel requirement in any other system. Of special significance is the contrast in *pipe* required. Jobs now held up by slow pipe deliveries can MOVE . . . if Dravo Heaters are used!

Any time that YOUR jobs are delayed or deferred because of steel or pipe shortages, why not find out how Dravo "Counterflo" Heaters are expediting things for other users? And remember — steel savings are just *one* of the reasons that more and more Dravo "Counterflo" Heaters are heating increasing numbers and types of structures. You'll find many other good reasons listed at right, that will appeal to you.



Each heating system compared below was sized to make up a calculated 12,000,000 Btu heat loss in this representative industrial building.

TOTAL METAL REQUIREMENTS FOR VARIOUS HEATING SYSTEM

COMPONENT	GAS FIRED					OI	
	DRAVO WARM AIR	HIGH PRESSURE CONVENTIONAL WATER TUBE BOILER	HIGH PRESSURE PACKAGED STEAM GENERATOR	LOW PRESSURE CONVENTIONAL WATER TUBE BOILER	LOW PRESSURE PACKAGED STEAM GENERATOR	DRAVO WARM AIR	HIGH PRESS CONVENTIO WATER TU BOILER
BASIC HEAT GENERATORS	26,400	38,000	62,000	38,000	62,000	26,400	38,00
PIPING—Oil—Steam Boiler Room—Gas	9,096	15,490	15,490	35,308	35,308	4,352	15,79
TANKS—Oil—Blow-off Condensate		3,500	1,500	1,500	1,500	13,000	16,50
UNIT HEATERS including Traps & Starters		21,240	21,240	21,240	21,240		21,24
STACKS & BREECHING	1,200	4,000	400	4,000	400	1,200	4,00
PUMPS—Fuel Oil Auxiliary Oil—Boiler Feed		1,000	1,000	1,000	1,000	400	1,40
STOKERS & FANS— including Dust Collectors Fuel Oil Preheaters							2,00
STRUCTURAL STEEL Boiler House Foundation Reinforcing		7,000	2,000	7,000			7,00
TONS of STEEL REQUIRED	DRAVO 18	45	52	54	61	DRAVO 23	53

NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

► Auto dealers' charges that the Federal Reserve Board delivered a sneak punch in the quick tightening of credit rules have apparently had no effect on Detroit's production schedules. All signs there now point to a continuation of present high level output except where material shortages force cutbacks. And some producers have increased their schedules within the past 2 weeks. Here as in other hard goods, the rule is "Run 'till the clock runs out."

Meanwhile Kaiser-Frazer is supplying more than 50 pct of the steel needed by its parts suppliers.

► The Army Signal Corps has developed a new noise meter to measure interference in radio or TV sets caused by electric motors, auto ignition, etc. It may mean increased range for TV stations and can be used to find defective automotive electrical equipment.

► Once present commitments are filled there will be very little steelmaking scrap available from Western Europe. Stepped up steelmaking operations in Germany and in England will take most of the available supply and a lot of rubble and battle scrap has already been shipped.

► A magnetic punch press feed now in experimental operation feeds circular blanks at the rate of 3 per second--about three times as fast as standard mechanical feeds. The device is not on the market and details cannot be disclosed now.

► The Navy is developing an electric governor to provide faster and more constant speed control of small generating plants. Unlike mechanical governors which operate on motor speed changes, the new governor reacts to changes in load current.

► Italy is so short of scrap steel that a leading pipe mill will sell pipe only in exchange for scrap. Meanwhile, U. S. oil companies have been able to buy substantial tonnages of German pipe, much of it for installation in their South American fields.

► Blanket draft deferments are going to be hard to get but tool and die makers have been told on good authority that they have a good chance to get deferments for really critical specialists if they act now and tell local Selective Service officials the unvarnished facts.

► The Army is now readying plastic tableware for mess hall use; acceptance by other government agencies may mean a new federal specification for these products.

► Addition of rare earths to stainless steel is now being tried experimentally in the melting departments of several steel producers. It is believed that the rare earths in minute quantities will eliminate columnar dendritic ingot structure in some grades.

► Low temperature physics studies at the Naval Research Laboratory have produced temperatures as low as 0.06° above absolute zero F. They are obtained inside 2 million watt electromagnets to study molecular and atomic structure by virtually stopping molecular motion. Object is to provide data on behavior of materials in extreme cold.

► Nine Army Ordnance plants will be partially reactivated during the next 90 days. Some 14,500 workers will be taken on. Which means more cartridge case brass, more shell steel.

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The bundle of sticks

A wise old man called his quarrelsome sons about him. Taking up a bundle of sticks, he commanded each in turn to break the sticks. All tried, but in vain, and said it could not be done.

"And yet, my boys, nothing is easier to do," said the father, as he undid the bundle and broke the sticks, one by one. "By this example, you can see that united you will be more than a match for your enemies; but if you quarrel and separate, your weakness will put you at the mercy of those who attack you."

The useful truth of this fable is just as timely today as it was when the Greek ex-slave Aesop told it 2,500 years ago. You, a patriot, believing in individual liberty and freedom for all, see our American way of life threatened by the menace of communism abroad and jeopardized at home by complacence, negligence, confusion and incompetence.

As a business leader in your own community, you have a particular responsibility to help unify your fellow citizens and guide their thinking and action--for the strengthening and preservation of the ideals that built America, in fact, made America the envy and goal of the very individuals now seeking to destroy it. *In Union there is Strength.*

The Youngstown Sheet and Tube Company

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MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

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Wage-Price Showdown Nears

Priorities — Third of Steel

Scrap Explosion Threatened

The Iron Age SUMMARY

IRON AND STEEL INDUSTRY TRENDS

THE steel wage-price showdown is nearer this week with the leading steelmaker knee deep in bargaining. Contract language, details on number of employees to be affected and a tough hammering by both sides on fringe issues were highlights of sessions during the past week.

Latest information indicates that THE IRON AGE original wage-price prediction will be close. Current figures being considered range from 11¢ to 12¢ on the wage base and 3¢ to 5¢ on fringes. With tough bargaining ahead these figures are not final. Down to earth arguments and negotiations may take a few weeks before the break comes in the steel price-wage picture.

May Take One-Third of Steel

Shortages of steel and nonferrous metals are bound to become a great deal more acute in the months ahead. This is true because the full weight of defense and essential civilian programs has not yet been felt. Within a few months these programs combined will be taking about a third of all steel produced.

Although the defense program will ultimately be much larger than was at first expected, it is slow in getting underway. A check of tool and die shops finds them very busy. But hardly 5 pct, if that much, of their activity is on defense orders. Actual defense production will probably lag from 9 to 18 months behind the freezing of designs and ordering of tools for an itemized rearmament program.

This is causing many people in industry to wonder how Washington can possibly justify mandatory cutbacks in consumption of materials by civilian industries — especially if the defense orders which will require this material and which these industries will turn out are not ready to be placed. If the cutbacks lead defense orders too far it is feared unemployment will result.

Of course much of the nonferrous production is headed for the strategic stockpile. This is a belated move. It will be recalled that most of these metals were in abundant supply a year ago, and prices were lower. But the government was in no hurry to stockpile them then. There is no doubt that much of the purpose of the stockpile has been defeated by bad timing.

Skilled Labor Will Be Bottleneck

The essential civilian programs—freight cars, petroleum, shipbuilding, etc.—will gather steam faster than defense orders. Many of the orders are already placed. Worst bottleneck, after material priorities are assured, will be skilled labor. Hiring offices are already scraping the bottom of the labor barrel for toolmakers, welders, machinists, etc.

Despite their best efforts to clean up old orders by the end of the year, the mills are now resigned to heavy carryovers into the first quarter of 1951. Some consumers insist that deliveries are falling still further behind. But this is not generally true because of the careful screening and cautious acceptance of orders during the past 3 months.

Formula Price Dikes Are Leaking

Pressure from a boiling scrap market this week is causing a few leaks in the so-called "formula" scrap prices. Upgrading is rampant. "Springboards" (consumers paying the freight) are appearing. And higher prices for small tonnages not yet considered representative have been noted in widely separated areas. Whether these cracks in the formula will precipitate a major explosion remains to be seen.

Perhaps the highest gray market price in history was paid by a Pittsburgh consumer recently. A shipment of gray market cold-rolled sheets cost him 31¢ per lb. or $620 per ton. This is ironical because the reason this company can't get steel from mill sources is that it was caught selling surplus steel in the gray market.

(Nonferrous summary, p. 148)

The bundle of sticks

A wise old man called his quarrelsome sons about him. Taking up a bundle of sticks, he commanded each in turn to break the sticks. All tried, but in vain, and said it could not be done.

"And yet, my boys, nothing is easier to do," said the father, as he undid the bundle and broke the sticks, one by one. "By this example, you can see that united you will be more than a match for your enemies; but if you quarrel and separate, your weakness will put you at the mercy of those who attack you."

The useful truth of this fable is just as timely today as it was when the Greek ex-slave Aesop told it 2,500 years ago. You, a patriot, believing in individual liberty and freedom for all, see our American way of life threatened by the menace of communism abroad and jeopardized at home by complacence, negligence, confusion and incompetence.

As a business leader in your own community, you have a particular responsibility to help unify your fellow citizens and guide their thinking and action--for the strengthening and preservation of the ideals that built America, in fact, made America the envy and goal of the very individuals now seeking to destroy it. *In Union there is Strength.*

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio
Export Offices--500 Fifth Avenue, New York

MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

RAILROAD TRACK SPIKES - CONDUIT - HOT AND COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RODS - SHEETS - PLATES.

Wage-Price Showdown Nears

Priorities — Third of Steel

Scrap Explosion Threatened

The Iron Age SUMMARY

IRON AND STEEL INDUSTRY TRENDS

THE steel wage-price showdown is nearer this week with the leading steelmaker knee deep in bargaining. Contract language, details on number of employees to be affected and a tough hammering by both sides on fringe issues were highlights of sessions during the past week.

Latest information indicates that THE IRON AGE original wage-price prediction will be close. Current figures being considered range from 11¢ to 12¢ on the wage base and 3¢ to 5¢ on fringes. With tough bargaining ahead these figures are not final. Down to earth arguments and negotiations may take a few weeks before the break comes in the steel price-wage picture.

May Take One-Third of Steel

Shortages of steel and nonferrous metals are bound to become a great deal more acute in the months ahead. This is true because the full weight of defense and essential civilian programs has not yet been felt. Within a few months these programs combined will be taking about a third of all steel produced.

Although the defense program will ultimately be much larger than was at first expected, it is slow in getting underway. A check of tool and die shops finds them very busy. But hardly 5 pct, if that much, of their activity is on defense orders. Actual defense production will probably lag from 9 to 18 months behind the freezing of designs and ordering of tools for an itemized rearmament program.

This is causing many people in industry to wonder how Washington can possibly justify mandatory cutbacks in consumption of materials by civilian industries — especially if the defense orders which will require this material and which these industries will turn out are not ready to be placed. If the cutbacks lead defense orders too far it is feared unemployment will result.

Of course much of the nonferrous production is headed for the strategic stockpile. This is a belated move. It will be recalled that most of these metals were in abundant supply a year ago, and prices were lower. But the government was in no hurry to stockpile them then. There is no doubt that much of the purpose of the stockpile has been defeated by bad timing.

Skilled Labor Will Be Bottleneck

The essential civilian programs—freight cars, petroleum, shipbuilding, etc.—will gather steam faster than defense orders. Many of the orders are already placed. Worst bottleneck, after material priorities are assured, will be skilled labor. Hiring offices are already scraping the bottom of the labor barrel for toolmakers, welders, machinists, etc.

Despite their best efforts to clean up old orders by the end of the year, the mills are now resigned to heavy carryovers into the first quarter of 1951. Some consumers insist that deliveries are falling still further behind. But this is not generally true because of the careful screening and cautious acceptance of orders during the past 3 months.

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(Nonferrous summary, p. 148)

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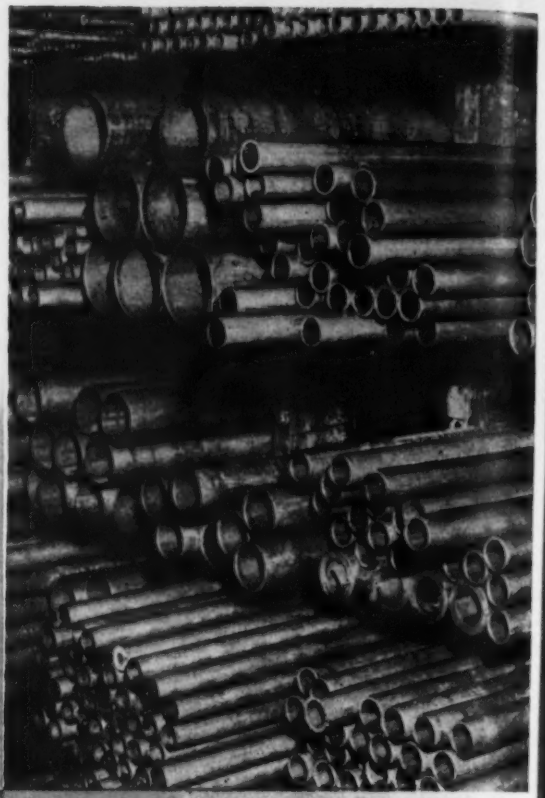
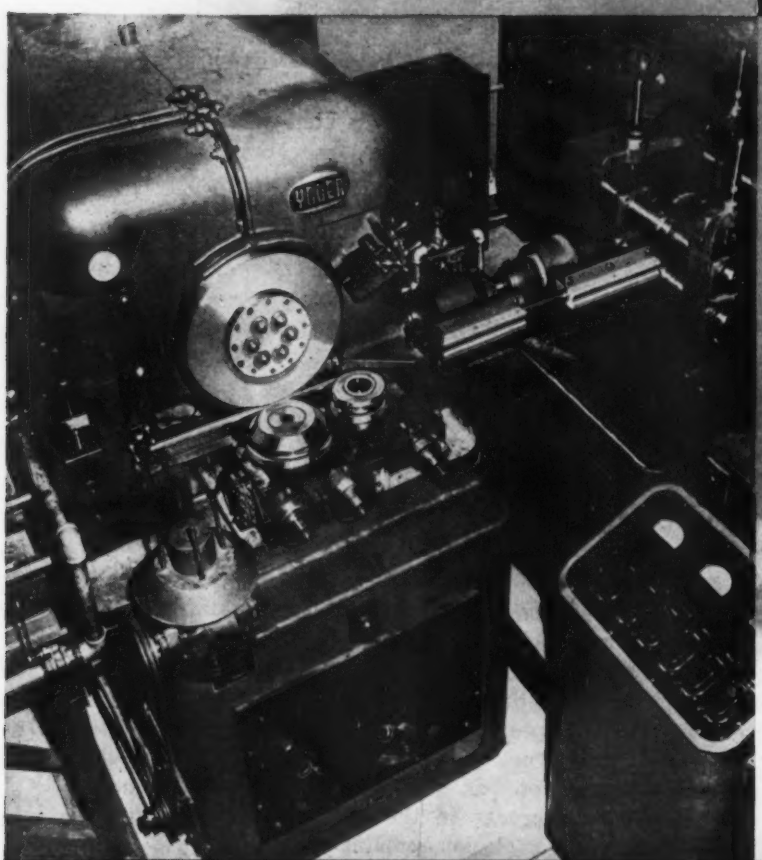
YODER ELECTRIC-WELD TUBE MILLS

for Higher Quality Pipe and Tubing at

LOWER COST





Lower cost—for more reasons than one! A Yoder mill gives you greater productive capacity per dollar invested than any other make or type of tube mill known. Its first cost, for example, is only a small fraction of that of a seamless mill or a furnace type mill for making welded pipe. A Yoder mill is extremely compact, requires a minimum of floor space. Tubes up to 4" or 5" o.d. can be made continuously from coiled strip welded end-to-end.

One single operator and a helper can turn out from 25,000 to 50,000 feet per 8-hr. day, in sizes up to 4" or larger. Weld strength equal to or greater than the metal itself. Scrap losses, power consumption and maintenance are negligible items.—These are but a few of the reasons why Yoder, during the past ten years have sold and installed more resistance-weld tube mills than all other makers combined. Send for 72-page book of facts about pipe and tube making by the Yoder method.

THE YODER COMPANY

5510 Walworth Ave. • Cleveland 2, Ohio, U.S.A.

Complete Production Lines

- ★ COLD-ROLL-FORMING and auxiliary machinery
- ★ GANG SLITTING LINES for Coils and Sheets
- ★ PIPE and TUBE MILLS—cold forming and welding

ENGINEERING YODER MANUFACTURING

*COLOR

For maximum production . . . top efficiency . . . lowest operating cost, give your machines the finest in lubricants—give them Tycol oils and greases.

Tycol lubricants are made to meet every lubrication need of industry—from roll neck greases for steel mills to spindle oils for textile plants.

Each Tycol lubricant is subjected to rigid tests during manufacture. This control assures the required lubrication characteristics—*COLOR, penetration, viscosity, to name a few—for maximum performance of that particular product. At every step from selection of crudes to blending of the finished product, Tycol lubricants provide maximum lubricating efficiency which means greater economy, longer life for every type of equipment.

Tide Water Associated will be glad to assist you in selecting the Tycol lubricant best suited to your specific need. Call or write your nearest office for further details.

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*LEARN WHAT THIS PRODUCT CHARACTERISTIC MEANS TO YOU — READ "LUBRICANIA"

This informative handbook, "Tide Water Associated Lubricania," gives clear, concise descriptions of the basic tests used to determine important properties of oils and greases. For your free copy, write to Tide Water Associated Oil Company, 17 Battery Place, New York 4, N. Y.

REFINERS AND MARKETERS OF VEEDOL — THE WORLD'S MOST FAMOUS MOTOR OIL

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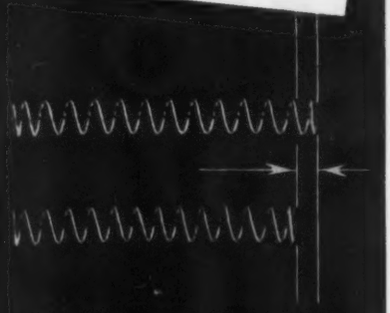
"FOR SPRINGS THAT STAY LIVELY LONGER!"



This actual photograph of two springs, taken after both springs had been subjected to the same tests, clearly indicates the superiority of ELGILOY as a spring material. Both springs were identical before testing! The ELGILOY spring (top) proved to have 5 times as much set resistance as the music wire spring!

ELGILOY

ELGILOY, fatigue resistant beyond any other spring material, is solving tough material problems wherever resistance to corrosion, set or fatigue is essential . . as in the manufacture of springs, instruments, valves, cameras and chemical processing equipment. In actual tests*, it has withstood over 1000 hours of salt spray exposure without evidence of corrosion!

ELGILOY is available for general industrial use in flats and rounds and can be blanked, formed, soldered, brazed or welded. Just mail the coupon below for information on the advantages of ELGILOY in *your* application.

**Tests performed in the Rock Island Arsenal Laboratory, 20% salt spray at 95° F.*

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I'd like to know more about ELGILOY for manufacturing

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INDUSTRIAL PRODUCTS DIVISION
ELGIN NATIONAL WATCH CO.
ELGIN, ILLINOIS

Fatigue Cracks

By CHARLES T. POST

Non-Voters

Now that the election is safely tucked away, you'll relish the apocryphal yarn passed along by P. M. Fahrendorf, Chilton vice-president, of the immigrant Irishman of 40 years ago. Mike walked down the gangplank, with his shovel slung over his back, to be welcomed to the land of opportunity by his brother. As they walked along the street, he stopped to gape at a steam shovel digging a huge excavation. After watching a moment, he turned on his heel and headed back towards the boat.

"Sure, and it's back to Erin Oi'm going," he declared. "O'il not be after digging to keep up with that monster."

The brother pleaded with him in vain until he finally turned the tide with, "Sure, Mike, there's a place for ye here. That shovel may dig more dirt, but the big divil can't vote."

In the News

We're glad to hear that the man on the street in Pittsburgh is not completely in the dark even though all the daily papers have been on strike. Frank & Seder, one of the big department stores, has been putting out a news sheet for its customers, which, we are pleased to find, includes a long bulletin from your favorite family journal. It takes more than a newspaper strike to keep your f.f.j. from being the most widely quoted business paper in the land. Haw!

Anti

Someone has finally taken up Mark Twain on his familiar complaint that "Everyone talks about the weather, but no one ever does anything about it." A news release on steel wage negotiations issued a fortnight ago by an intimate source declared, "Meetings and negotiations from here on out will be anticlimatic."

Sounds like iconoclastic labor activity to us.

Book Review

Your favorite family journal's book review editor is looking for an evaluation on Technical Bulletin 79 of the Missouri School of Mines entitled, "A New Lituolid Foraminiferal Genus from the Cretaceous, with an Emendation of Cribrostomoides Cushman." Any comments would collide head-on with an editorial department dictum to concentrate on two- and three-syllable words.

Puzzlers

Since we skipped a beat by involuntarily turning Fatigue Cracks over to a proxy fortnight ago, you're still missing the answer on the printer-and-the-circulars problem of Oct. 26. C. E. Blass of Talon, Inc., knew the answer was $49 for 7000 circulars, and so did F. L. Barrows of Kelvinator, C. I. Gardner of Orinoco Mining, Arthur A. Coffin, Jr., of A. G. Becker, C. E. Norton of Highland Park, Ill.

Wrong answers continue to come in to the counterfeit bill puzzler of Oct. 19, but Reader Blass, along with E. M. Hoover of the President's Council of Economic Advisers, and Miss Jessie Thornton, with George A. Small, manufacturer's agent, correctly chimed in with "$85 and a pair of shoes."

Oscar Quist says the inclination of last week's plate, resting on the three balls, is 30 deg. 14 min. 10 sec.

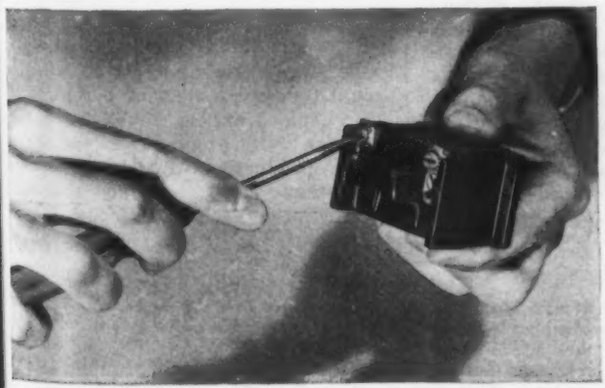
Charles G. Heilman, Commonwealth Industries, Inc., suggests this:

Elmer Brown, a garage owner, never bothered to keep a record of his tire sales, but last Aug. 1, he decided to take inventory. His stock included automobile and motorcycle tires. Although he remembered that he had sold a set of tires each day during the last two months, and the total number of tires sold was 208, he did not know the number of each type sold. How many tires of each kind did he sell?

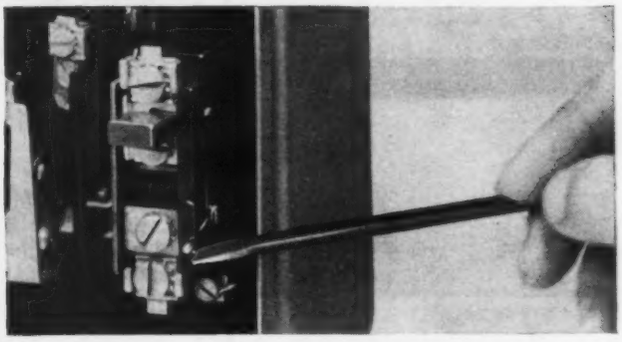
install for these 6 reasons

ABOUT THESE IMPORTANT FEATURES WITH THE "SCREWDRIVER TEST"

3 Mr. Perito: "*Are all the terminals easy to get at?*" Every one of them is *up front* where it's easy to get at, and wire. And they're *big* terminals with panhead screws and saddle-type connectors that ride up with the screw head. The stripped wire simply slides into place and is easily secured with a turn of your screwdriver.



4 Mr. Perito: "*Tough-looking coil! Is it new?*" Right! It's called the "Strongbox Magnet Coil" and it's an exclusive with the new G-E starter line. Feel how solid it is! If your electrician's screwdriver slips, it can't hurt the windings—they're safely locked in a block of molded plastic. And oil, dust or water can't get at them, either!



5 Mr. Perito: "*How do I set the overloads?*" Easy—and you don't have to take the starter apart to do it. Flip that little lever and it's on "Automatic." Flip it back and it's on "Manual." Heaters are in the front, can be changed without disturbing any wiring.

6 Mr. Perito: "*What about maintenance?*" Once this new G-E starter is installed, it *stays* installed. There's no need to remove the case for ordinary maintenance or even to replace or reverse contacts. Just remove the arc chute and there are your terminals.

WHY DON'T *YOU*

"BUY ONE AND COMPARE?"

See for yourself why this new line of G-E motor starters lasts longer, costs less to install than almost any other starter you can buy. Your G-E representative or authorized G-E agent or distributor can supply you from stock in NEMA sizes 0, 1, 2 and 3 for a-c motors up to 50 hp. For a complete description, write for Bulletin GEA-5153. *Section 730-18, Apparatus Dept., General Electric Company, Schenectady 5, New York.*

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FURNACE PROBLEMS
are Frequently Solved

by REMMEY
RM
SEMISILICA BRICKS

When heating furnace roofs, open hearth regenerator roofs and hot blast stoves are operating in the temperature range of 2200F.-2700F. for sufficient time to cause "First Quality Clay Bricks" to spall and vitrify or sag—and where the performance of silica bricks is hindered by shut-downs and severe temperature changes, a need is created for REMMEY RM Semisilica bricks.

If your furnace problem falls in this category, Semisilica bricks are the answer . . . specify REMMEY RM Brand SEMISILICAS.

REMMEY

Dependable Refractories

RICHARD C. REMMEY SON CO.
Philadelphia 37, Pennsylvania

Dear Editor

Letters from Readers

Pay Key Help More

Sir:

I have read with interest Tom C. Campbell's timely editorial "Take Care of Your Key Men" in the Oct. 26 issue. I have always felt that management has been lax in compensating their white collar help in line with other wage increases. This not only applies to key men but all white collar help. Now is the time for all top management to do something about it.

E. J. CARLSON
President
Indiana Forge & Machine Co.
East Chicago, Ind.

Corrected Correction

We thought we had this matter of the Dorr's pretty well settled until another typographical error crept into this column in our Oct. 26 issue. For the record: John Van N. Dorr II wrote the article, "How Much Iron Ore in Brazil" (Aug. 17 and 24). His uncle, John Van N. Dorr, heads the Dorr Co., Stamford, Conn., manufacturers of machinery for the mining, chemical, etc., industries.—Ed.

Never Standardized

Sir:

We are about to set up a color chart on bar steel, and we have information from some of our vendors that a standardized color chart is being set up by the various steel companies and warehouses. In checking the charts for the various companies, we find that their charts do not agree. Do you have any information as to where we could obtain a copy of a standardized steel color chart?

P. B. CRESSOR, JR.
Asst. Purchasing Agent
Eureka Williams Corp.
Bloomington, Ill.

There is no such animal as a standardized color chart and there probably never will be. Steel producers have had a crack at it and so have the warehouses. Trouble is there are too many analyses of steel which would require too many fancy color combinations. A warehouse handling certain types could use a group of simple color combinations and another warehouse with another line of steels could also keep to simple color combinations. Apparently if colors were designed to suit all kinds of steel the color combinations would run riot. Many years ago the Purchasing Agents Assn. in cooperation with the the Bureau of Standards developed a standard code for marking bars. It was a flop.—Ed.

"Secret" Blast Furnace

Sir:

With reference to THE IRON AGE Sept. 21 issue, I was interested in the drawing of the all-welded American furnace using all carbon lining which appears opposite p. 93 of H. A. Brassert's article. I should be very interested indeed to know where the type of furnace illustrated is located.

R. SEWELL
Information Officer
United Steel Companies Ltd.
Sheffield, England

The blast furnace shown represents the engineering design for a furnace to be constructed for an American steel company whose name we cannot at present disclose. Possibly you may be able to secure this information by writing to the author, who may be addressed c/o H. S. Brassert Co., 60 East 42nd St., New York. A blast furnace embodying many of the same features has been built, we understand, for Compania de Acero del Pacifico, S.A., Casilla 1-c, Talcahuano, Chile. The furnace is located at Concepcion, Chile.—Ed.

Swamped With Requests

Sir:

Will you be good enough to send us a copy of the free reprint of your Aug. 3 article relating to details of the German "C" (Croning) resin-sand process for the highspeed production of accurate castings.

J. CHESLER
President
J. Chesler & Sons, Inc.
Brooklyn

Sir:

I understand that your Aug. 3 issue carried an article on the German "C" process and that you have free reprints available. I would certainly appreciate your sending me a copy of this article.

J. M. VAN VLEET
Vice President
Line Material Co.
Milwaukee

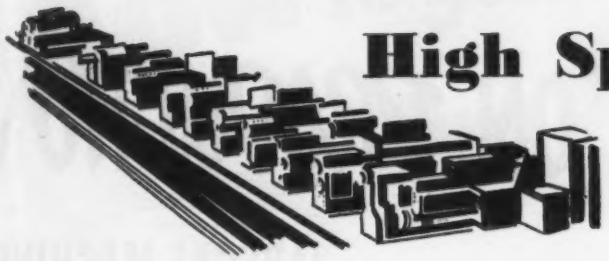
Sir:

It would be appreciated if you could forward a copy of a reprint of your Aug. 3 article, dealing with the German "C" process for the high-speed production of castings. This item has come to our attention through the Technical Reports News Letter of the U. S. Department of Commerce.

W. J. HANSEN, Director
Trade & Marketing Services
Dept. of Cooperation & Cooperative Development
Province of Saskatchewan, Can.

The article "Detroit Spending Millions on Foundry Process," written by Walter Patton, our Detroit editor, is an exclusive account of what the automotive industry has done with the so-called resin-sand or Croning process for making molds. While the article does not deal strictly with the technical aspects of the process, it does present the inside story of how important this revolutionary technique is to industry. A few copies of this popular reprint are still available, free of charge, from our Reader Service Dept. —Ed.

MACHINE TOOL High Spots



Sales Inquiries and Production

By W. A. LLOYD

Steel and Manpower—Need for priorities in the machine tool industry was becoming acute this week as shortages of materials, particularly steel, motors and controls, continued to mount. Modernization and replacement buying, coupled with defense and MAP orders, are keeping new order volume at a very high level, and backlog is increasing.

Six months ago the industry was slowly emerging from the business doldrums. Within 30 days it was in a boom. In plant and equipment the industry is equal to the present upsurge. But its recent quotas for steel and certain components will not support the present rate of production, and the industry's manpower is numerically inadequate.

Bottleneck Charges—The industry is moving toward the saturation point, which will make it appear vulnerable to the charge of "bottleneck" by bureaucrats.

The grapevine says MAP order volume is going to be much greater than originally anticipated and Great Britain's requirements alone will total $125 million.

If Rumors Prove True—Two weeks ago, the entire MAP requirement was supposed to be about $150 million, of which an estimated $75 million would be placed at the present time.

If all that appears to be on the way materializes, or to put it another way, if this mass of rumor is correct, the machine tool industry's backlogs will be 20 times the current rate of shipments.

Lease Reserve Tools—In Cleveland, machine tools held in "reserve" by the armed forces can be applied for, on a lease basis, for urgent defense contracts, John H. Williams, chief, industrial equipment division, Office of Production Planning, Munitions Board, told members of National Tool & Die Manufacturers Assn. at their fifth annual meeting.

He said great progress has been made in re-equipping and preserving machine tools held in reserve. One branch of the armed services has disassembled all machines in its reserve and replaced worn or missing parts.

Strategic Survey—Mr. Williams compliments tool and die makers cooperating in the industry-wide survey of facilities. He said his office has received data from about 60 pct of the 2500 contract shops. When the survey is completed, procurement offices will for the first time know the location of specialized tool and die making equipment and manpower which might be used strategically.

Canadian Tool Works—In Toronto, A. C. Wickman (Canada) Ltd., has acquired controlling interest in Modern Tool Works, Ltd., under an option given by shareholders representing more than 97 pct of the 100,000 common shares outstanding. The shares are being taken up at $8.50 a share.

No important changes in policy, product lines, operation or management are contemplated in the immediate future. Edgar Barker continues as president and managing director and Axel C. Wickman becomes a director and advisory consultant of Modern Tool Works, Ltd.

Technical Conference—In New York, American Institute of Electrical Engineers announced that the 1950 technical conference on electrical engineering in the machine tool industry will be held Nov. 14-16 in the Sheraton Hotel, Worcester, Mass.

It will be held by the Machine Tool subcommittee of the AIEE, committee on general industry applications in conjunction with the Worcester chapter of the AIEE.

Transfer Jet Operations — In Cincinnati, transfer of many of the jet engine development operations of General Electric Co. at West Lynn, Mass., to the General Electric Lockland plant here was reported. G.E. leases the north shop of the former Wright plant from the Electric Auto Lite Co., owner of the three main shops.

Monarch Profits—Third quarter earnings of Monarch Machine Tool Co. for period ended Sept. 30 totaled $152,132, Jerome A. Raterman, president, reported. Net earnings for the third quarter of 1949 were $128,319. Net earnings for the first 9 months of 1950 totaled $367,249 compared with net earnings of $407,750 for the first 9 months of 1949.

Buys Rights—Ohio Electric Mfg. Co. has purchased tools, dies, fixtures, patents and rights to manufacture Taylor & Fenn drilling machines, according to Chester Bland, Ohio Electric president. The equipment will be moved from Hartford, Conn., to Cleveland.

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"DOUBLING-UP" ON PRODUCTION

. . . *at* JARECKI MACHINE

300 PAIRS PER HOUR—The extra capacity and rigidity of Danly Presses permit flexibility of die arrangement. Every press in the Danly line is tooled with two sets of dies to stamp these automotive front door hinge pillars two at a time.

With press time at a premium and schedules pushing capacity to the limit, the advantages of Danly Press construction and engineering features are more important than ever. At Jarecki, the full-rated die capacity and extra slide rigidity of Danly Presses made possible production of the parts shown above in pairs—two at a stroke!

Danly Presses are built with machine tool precision, built to withstand the punishment of round-the-clock operation. Write today for the unusually complete Danly Straight Side Press Catalog. See how Danly Presses will help you meet production schedules.

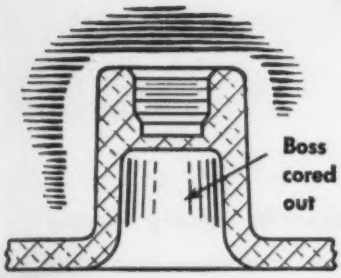
STRAIGHT LINE ARRANGEMENT of the Danly Press line makes material handling fast and easy . . . and makes uninterrupted press operation a *must*. Danly features like complete pressure lubrication and "proved safe" controls assure minimum press down time.

DOUBLE DIE TOOLING used throughout the Danly line is shown in this close-up view. Extra long, precision gibs contain the entire slide at all times during the working stroke, providing the extra rigidity to make this "double production" set-up possible!

FULL-RATED DIE SPACE is an important feature of Danly Press design, particularly when big drawing dies like the one shown here are used. Danly presses have the *designated* die space between the gibs.

PRECISION DRAWING DIES for pr tion stamping of important autom and home appliance component produced in the modern Jarecki room, one of the largest tool and job shops in the world.

How to get the mo$t fo$ Zinc Die Ca$ting D$!



$ SAVE METAL

Remember that studs and bosses can be accurately cast in place, thereby providing a highly economical means of fastening a ZINC Die Casting to a mating part. Designers also find cast bosses useful as locating points for subsequent machining operations, to act as spacers, to serve as ejection points, or to equalize stresses. If heavy bosses are called for, you can save metal (without sacrificing strength) by coring them part way, as shown above.

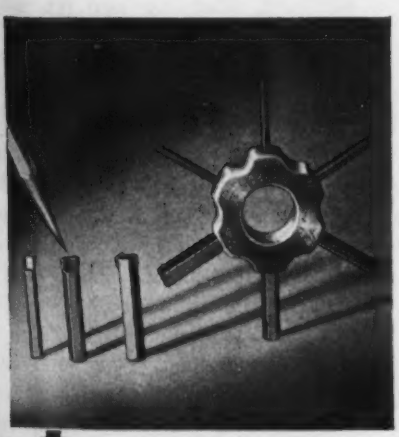
The reason you are using—or will use—ZINC Die Castings in your products is just this—they do the best job at the lowest possible cost. As with any other material or manufacturing method, however, the true economy of ZINC Die Castings can only be realized through skillful adaptation of the design to the process. On this page you will find several hints to help you get the most for your ZINC Die Casting dollar.

For additional information along these lines ask us—or your die caster—for a copy of "Designing For Die Casting".

Send for your copy

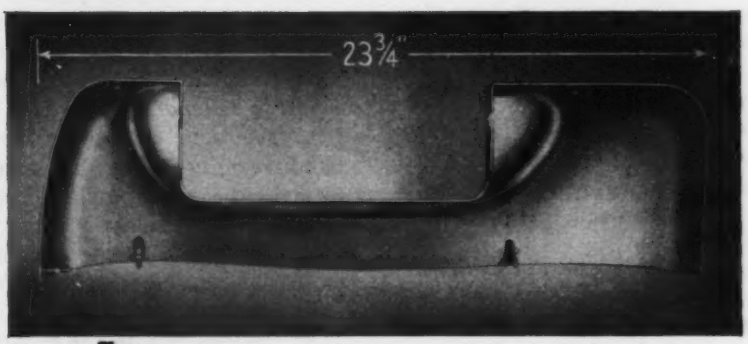
The New Jersey Zinc Company
160 Front St., New York 7, N. Y.

ZINC
FOR DIE CASTING ALLOYS



$ USE INSERTS

The six individual steel wrenches (for socket screws) are cast as inserts in the above tool. By partially flattening the ends of these inserts (see pencil) before insertion in the die, permanent anchorage is assured when the ZINC Alloy is cast around them.



$ GET IT ALL IN ONE PIECE

You can keep down your handling and assembly costs by incorporating as many features as possible in a single casting. Consider, for example, the above ZINC Die Casting which, with a mating half, forms an entire washing machine wringer frame—complete with cast assembly elements. The unusual castability of ZINC Alloy permitted the complex contours and the transition from thick to thin sections.

The Research was done, the Alloys were developed, and most Die Castings are based on

HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

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PUBLICATIONS

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

Cr-Ni Alloy Steels

The ABC of alloy steel selection is concisely presented in a new 14-p. booklet describing two steels that simplify your alloy needs. Comparative properties of case-hardening and tough or hard-tempering steels are shown. The booklet details characteristics, properties and chemistry for Carpenter No. 158 and No. 5-317 chrome-nickel alloy steels, and lists recommended uses for each. *Carpenter Steel Co.*

For free copy insert No. 1 on postcard.

Grinding Machines

The latest design 10 and 14 in. Landis type CH plain hydraulic cylindrical grinding machines are described in a new 22-p. illustrated catalog. The many modern features of this equipment are shown, and sections of the booklet describe semi-automatic operation of angular wheel base grinding. Specifications for both size machines are listed; standard and extra equipment is also dealt with. *Landis Tool Co.*

For free copy insert No. 2 on postcard.

Hydraulic Fundamentals

A new 44-p. technical bulletin covers fundamental information on hydraulic systems, maintenance, trouble-shooting and selection of proper fluids. In addition to engineering and other technical personnel, management men should find "Hydraulic Fundamentals and Industrial Hydraulic Oils" a valuable training aid or guide for maintenance supervisors, operators and apprentices. Quantities of the bulletin are offered free for this purpose. A complete revision of a former manual, this new edition features specially prepared phantom and cutaway drawings illustrating functions of basic types of valves, pumps, hydraulic motors and torque converters. *Address requests for the bulletin on company letterhead to Sun Oil Co., Philadelphia 3.*

Electric Hoists, Cranes

Northern overhead electric traveling cranes and hoist cranes, combining high speed and easy handling with the ability to stand hard service and overloads, are shown in a new 4-p. folder. The bulletin describes features of various models covering a range of capacities from 1 to 100 tons, and tells how the hand-travel types may be converted to motorized travel at low cost. A high-lift, low headroom heavy duty hoist with up to 15 tons capacity is also shown. *Northern Engineering Works.*

For free copy insert No. 3 on postcard.

Bearing Design Shown

Reliance pre-lubricated bearing design, developed to provide more hours of motor operating life without relubrication, is the subject of a new 4-p. bulletin. The illustrated folder contains descriptive sketches, cutaway drawings of the improved double shielded bearings and their bracket mounting, and a check list which compares other bearing arrangements with this design. *Reliance Electric & Engineering Co.*

For free copy insert No. 4 on postcard.

For Low Cost Welding

Manual Lincolnweld is described as an important advancement in shielded arc welding, in a new 6-p. folder. How the method cuts welding costs, increases welding speeds and reduces need for joint preparation is discussed in the folder. The unit is described in detail and information is presented on its use for butt, fillet, tee and lap welds. *Lincoln Electric Co.*

For free copy insert No. 5 on postcard.

Arch Economy

Exclusive features in Reintjes double-hung arch construction that produce lower refractory and maintenance costs, as well as less operating time lost for arch repairs, are covered in a new 4-p. folder. Standardized shapes resulting in inventory reduction are described, and the ease of erection is graphically shown. Versatility of the fan-tail nosings is also illustrated. *Geo. P. Reintjes Co.*

For free copy insert No. 6 on postcard.

Painting Data Given

How to properly select and apply paint and paint products for industrial use is the subject of a 12-p. booklet specifically written for users in the electrical manufacturing fields, public utilities, steel fabricators and industrial maintenance. Complete information for application of primers and finishes

Turn to Page 136

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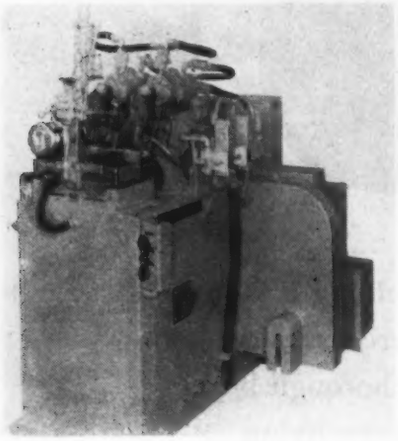
tically all standard ASA and API fittings and for special applications. A choice of metals and filler materials is available. *Flexitallic Gasket Co.*

For more data insert No. 20 on postcard, p. 35.

Spot Welder

One operator using three welders can weld 770 spouts to coffee pots per hr.

The welder illustrated spot welds spouts to stainless steel coffee pots. It is equipped with one transformer for two welds. Spot spacing, work indexing and electrode operation are automatically controlled. Two pouring spouts are welded to two pots during one



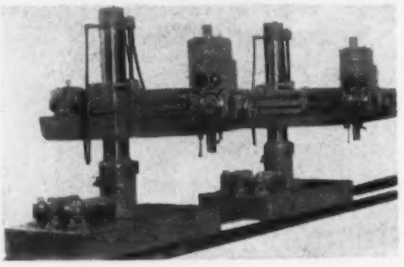
operation of the welder. Two water-tight seams of 66 spots each, are made around the spouts in 20 sec. With minor gear and cam alterations, the welder is adaptable to welding other products. These changes permit spot spacing and electrode positioning on the outline of any curved surface within the maximum movement limitations of the equipment. *Taylor Winfield Corp.*

For more data insert No. 21 on postcard, p. 35.

Radial Drills

Traveling, roller bearing-mounted base adds improved flexibility.

The base, 46 in. wide x 90 in. long, rides on horizontal boring mill runways or 100-lb rails. The gage is 3 ft. All power and electrical equipment is completely enclosed. Traversing, clamping and coolant pump controls are mounted on the base and duplicated on the drill head for operator convenience. Power traversing and clamping equipment is optional. Under power the unit traverses at a rate of 50



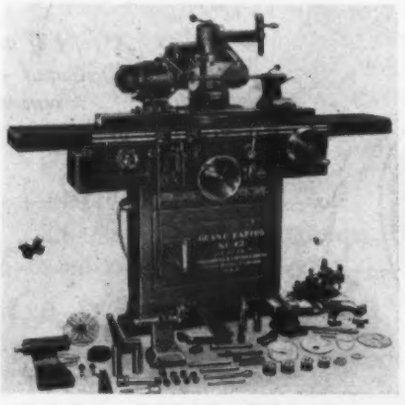
fpm, using a 1½ hp, 960 rpm motor adaptable to ac or dc sources, a reversing control, worm-driven speed reducer, and heavy bevel gears for the final drive to one axle. All mechanism operates in oil or is permanently lubricated. *Cincinnati Gilbert Machine Tool Co.*

For more data insert No. 22 on postcard, p. 35.

Cutter and Tool Grinder

Swings 12-in. diam work and has 24-in. longitudinal table movement.

The table of this new motor driven power feed universal grinder is 6 x 42 in. with a single 9/16 in. T slot running its entire length. Distance between workhead and tailstock centers measures 28 in. The Model 62 is a



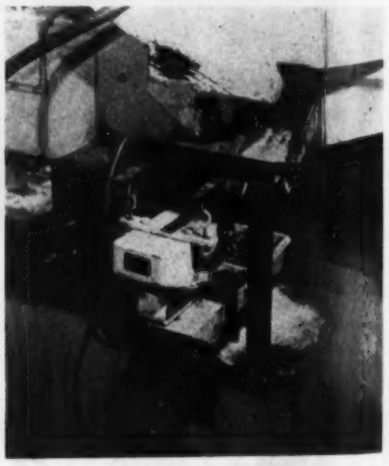
cabinet base machine featuring anti-friction ball bearing table with the ball bearings carried in micarta track, the raising and lowering of the grinding wheel head and the cross feeding of the head and column such that the sub-table and table remain fixed as to vertical and transverse movement. Power feed, optional on the No. 62, provides an infinite number of longitudinal table speeds from 4 to 100 ipm. A master handwheel provides three speeds of ½, 3½, and 8¼ ipr of the handwheel. *Gallmeyer & Livingston Co.*

For more data insert No. 23 on postcard, p. 35.

Vibratory Feeder

Screening feeder desludges machine tool coolant liquid.

A new vibratory screening feeder has been developed for installation on the edge of coolant tanks of machine tools to prevent steel filings and abrasive grains filling up the tank. The used coolant from the machine runs through the vibrating screen which catches the filings and abrasive grains and feeds them



as sludge into a receptacle. The desludged and clean coolant liquid goes back into the storage tank for re-use. It is estimated that the feeder removes approximately 90 pct of the sludge from the coolant. *Syntron Co.*

For more data insert No. 24 on postcard, p. 35.

Rod Cutter

Cuts ⅝-in. diam rods and bars without distorting material.

The Di-Arco power parter has been designed for parting-off rods and bars as rapidly as the operator can advance the bar and engage the foot lever. The machine is equipped with an air cylinder, cushioned at both ends for quiet and efficient operation, and each cutting cycle is instantly obtained through a four-way foot valve. Capacity of the machine ranges

Turn to Page 138

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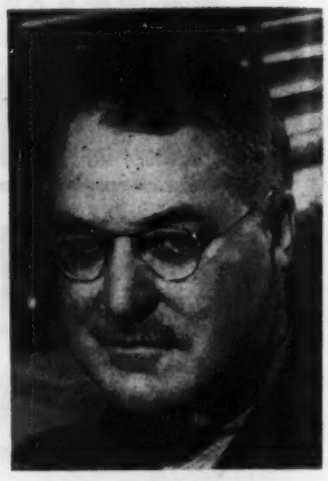
Iron Age *Introduces*

C. R. DOBSON, executive vice-president of H. K. Porter Co., Inc., Pittsburgh, elected vice-president, chairman executive committee Connors Steel Co., Inc., Birmingham.

AUSTIN C. ROSS, elected a vice-president of Worthington Pump & Machinery Corp., Harrison, N. J.



J. S. SNELHAM, formerly vice-president and comptroller of the Continental Can Co., New York, promoted to the newly created post of vice-president in charge of finance.

Richard H. DeMott, formerly vice-president in charge of sales for SKF INDUSTRIES, INC., Philadelphia, elected president. Mr. DeMott succeeds **William L. Batt,** who resigned to re-enter Government service.

William W. Monahan, appointed vice-president in charge of industrial relations for the KAISER-FRAZER CORP., Willow Run, Mich. Mr. Monahan succeeds Robert A. Graney, who recently resigned.

Gilbert H. Scribner, elected a director of the INTERNATIONAL BUSINESS MACHINES CORP., New York.

William B. Renois, elected vice-president of sales for the GERRARD STEEL STRAPPING CO., Chicago. Mr. Renois succeeds **S. G. Adolf Larsen,** who was named assistant to the president.

John F. Fennelly, elected a member of the board of directors for the STEWART-WARNER CORP., Chicago.

B. S. Stephenson, president, Tonawanda Iron Div., of the AMERICAN-STANDARD CORP., has retired.

Arthur P. Wilson, formerly vice-president of Frank C. Brown & Co., joined the staff of the TRUNDLE ENGINEERING CO., Cleveland.

Stanley M. Tracy has not retired from the DRIVER-HARRIS CO., Harrison, N. J., as reported in this column Oct. 19. He has served the firm for 40 years, since 1938 as executive vice-president, and is still going strong.

Ernest C. Britton, appointed vice-president of the THEODORE W. FOSTER & BROTHER CO., Providence. Mr. Britton was formerly associated with the Plume & Atwood Mfg. Co., Waterbury, Conn.

Ferguson Barnes resigned as vice-president and general manager, Columbus Div., INTERNATIONAL DERRICK & EQUIPMENT CO., Dallas. **C. Edwin Ponkey** will succeed Mr. Barnes as general manager.

Dr. Rudolph Zillman, named metallurgist for the PITTBURGH STEEL FOUNDRY CORP., Glassport, Pa.

E. J. Bomholt, appointed plant manager, New Idea Div., for the AVCO MFG. CORP., Coldwater, Ohio.

Albert H. Clem, appointed to the newly created post of assistant to the vice-president in charge of sales, for the PENNSYLVANIA SALT MFG. CO., Philadelphia. **Horace F. McIntyre,** appointed product supervisor, Special Chemicals Dept., and **John M. Davidson,** formerly sales service representative, Pittsburgh district, made district sales manager.

C. F. Gruenert, named manager, Rochester-Buffalo branch, and **R. E. Wollert,** manager, Detroit branch, for the INLAND STEEL CO., Milwaukee.

Dr. John W. McNall, named division engineer, Research Dept., Lamp Div., for the WESTINGHOUSE ELECTRIC CORP., Pittsburgh.

Stig Cronstron, named assistant to the vice-president in charge of sales for the AMERICAN TYPE FOUNDERS SALES CORP., Elizabeth, N. J. Mr. Cronstrom will be in charge of the new office in Stockholm, Sweden.

J. D. Henry, appointed general superintendent for the LAKE TERMINAL RAILROAD CO., Pittsburgh. Mr. Henry's headquarters will be in Lorain, Ohio.

Emil F. Frey, formerly assistant sales manager for the DeVILBISS CO., Toledo, promoted to director of sales promotion and advertising. **Henry M. Kidd,** named sales manager, spray equipment sales; **Don E. Fenstermaker,** sales manager, Perfume and Medicinal Atomizer Div., and **John M. Enhi,** made export manager and branch plant coordinator.

R. A. Hoffman, appointed director of research for ALLIED RESEARCH PRODUCTS, INC., Baltimore.

Arthur R. Walton, made freight traffic manager for the ERIE RAILROAD CO., Cleveland.

J. H. Perry, Jr., appointed district manager, Philadelphia and Washington territories, for the EDGEWATER STEEL CO., Pittsburgh.

Warren Forsyth, appointed assistant manager, Multnomah Iron Works, Mfg. Div., of R. M. WADE & CO., Portland, Ore.

William C. Lilliendahl, appointed research advisory engineer, Lamp Div., for the WESTINGHOUSE ELECTRIC CORP., Pittsburgh.

Fred E. Haker, retired as director of purchases for the ALLIS-CHALMERS MFG. CO., Milwaukee, after 50 years of service with the firm. **Kenneth R. Geist,** formerly assistant to the director of purchases will succeed Mr. Haker.

Louis H. Oppenheim, named assistant general manager, Kaiser Engineers Div., of the KAISER INDUSTRIES, INC., Oakland, Calif.

Herman D. Rowe, named manager of the new engine plant in Cleveland for the FORD MOTOR CO., Dearborn.

I. L. Wallace, formerly superintendent, Carbide Metal Div., named manager of engineering for the CARBOLOY CO., Detroit. **J. A. Muldoon,** appointed manager of manufacturing for carbides and other special metals; **R. L. Brownlee,** manager for other special metals and **F. C. Ritner,** assistant to the executive vice-president. **A. J. DeCarlo,** made manager of purchasing and materials.

Hodge C. Morton, named director of sales for the AUTOMATIC WASHER CO., Newton, Iowa.

William P. Newdome, named sales engineer for FURNACE ENGINEERS, INC., Pittsburgh.

Iron Age Salutes

HARRY L. ERLICHER

RECENTLY, at 7:00 one morning, heavily armed Pentagon guards saw coming up the ramp a gentleman who might well be a general in civilian clothes. But the earliness of the hour puzzled them. Their faith in Army routine was restored when the visitor identified himself as civilian Harry L. Erlicher of Schenectady and General Electric Co. on special assignment for the Under Secretary of the Army.

Now the sentries take his early arrivals as a matter of course, but can't quite become 100 pct accustomed to a guy getting on the line an hour before he has to. But this is typical of Harry Erlicher who is vice-president of GE in charge of purchasing and traffic, heads the Committee on Army Supply Methods, and still finds time to direct his local Community Chest drive, while keeping active membership in several clubs.

It is also typical of Mr. Erlicher that he has praise for those he works with. Of the Army people he says, "By their very attitude toward outsiders like myself they court cooperation. The job they are doing, especially in the current emergency, is really fantastic."

Harry Erlicher's life is a success story marked with historical events. At the moment he was born, Schenectady was excited about the prospect of Thomas A. Edison moving there with his Edison Machine Works which was the predecessor company of GE. As a youth he worked as grocery boy, paper boy, errand boy for GE shopmen, and anything else he could find. But he still made good grades in school.

Soon after joining GE he was promoted to office boy. Because of his interest in purchasing he asked to be transferred to the purchasing department where he soon became a clerk. In 1910 he was a buyer. Thirteen years later he was assistant purchasing agent and in 1931 became general purchasing agent. In 1940 he was elected vice-president, becoming chief of purchasing and traffic.

Today Mr. Erlicher is widely known because he buys a multitude of materials from 31,000 suppliers. He tries to dismiss himself from personal renown by saying that if he didn't know a lot of people he wouldn't be any good as a purchasing agent.

But part of the truth is that he likes people, listens to them and understands them. The closest he ever came to being "brass" is the cuspidor he used to have in his office.

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ALFRED H. DREWES, named a director and member of the executive committee of the National Lead Co., New York.

HUNTER MICHAELS, elected vice-president of the American Locomotive Co., New York.

T. M. EVANS, elected president of Connors Steel Co., Inc., Birmingham, is also president of H. K. Porter Co., Inc., Pittsburgh.

Leo P. Gajda, appointed chief engineer of the ARTHUR COLTON CO., Detroit and **Cecil Edgar,** named chief draftsman.

R. P. Clausen, appointed chief engineer, Radio Tube Div., for SYLVANIA ELECTRIC PRODUCTS, INC., Emporium, Pa. Mr. Clausen succeeds **M. A. Acheson** who has been transferred to the staff of the vice-president in charge of engineering.

Philip C. Neuman, and **William C. Campbell, Jr.,** named sales representatives, Pittsburgh district, for the ALLIS-CHALMERS MFG. CO., Milwaukee.

John M. Walsh, Jr., appointed division superintendent of blast furnaces, Gary Works, of the CARNEGIE-ILLINOIS STEEL CORP., Pittsburgh, following the retirement of **G. Paul Burks.**

Peter G. Schmitt, named manager, Specialty Div., of the WESTINGHOUSE ELECTRIC INTERNATIONAL CO., New York.

W. G. Holley, named general manager for DAVID ROUND & SON, Cleveland. **W. J. McSherry** will succeed Mr. Holley as sales manager.

John T. Castles, appointed manager, Chemical Dept., silicone plant, Waterford, N. Y., for the GENERAL ELECTRIC CO., Schenectady.

Buel A. Devine, appointed commodity sales manager, Wolverine Tube Div., for CALUMET & HECLA CONSOLIDATED COPPER CO., Detroit.

Paul E. Crafton, appointed Chattanooga district sales engineer for the F. J. EVANS ENGINEERING CO., Birmingham.

John B. Keeler, formerly manager, Traffic and Transportation Dept., of the KOPPERS CO., INC., elected a vice-president.

A. D. Sheere, appointed manager, San Francisco div., for the A. M. BYERS CO., Pittsburgh. Mr. Sheere succeeds **P. D. Tabler,** who is retiring.

William J. Borth, named by WILLYS-OVERLAND MOTORS, INC., Toledo, to assist in the procurement of materials vital to the automotive firm's civilian and defense production.

R. H. McPeake, named sales manager for the ALDRICH PUMP CO., Allentown, Pa.

Wayne E. Williams, appointed western district manager, Canadian district, for TUBE TURNS, INC., Louisville, Ky.

Allan L. Davis, named manager of service, Transportation Div., Apparatus Dept., for the GENERAL ELECTRIC CO., Schenectady.

Richard E. Estabrook, named general manager for BEDE PRODUCTS, INC., Cleveland. **Frank G. Drake,** formerly eastern district sales manager, will succed Mr. Estabrook as general sales manager.

Raymond T. Porter, appointed eastern sales manager for the HEPPENSTALL CO., Pittsburgh.

George L. Fenn, secretary and assistant treasurer, named to the board of directors for the ADAMSON-UNITED CO., Akron, Ohio.

Robert Jefferson Carter, appointed southwestern district manager for the STONE & WEBSTER ENGINEERING CORP., New York.

OBITUARIES

William Joe Richardson, 40, senior draftsman, Birmingham plant, of the Virginia Bridge Co., Roanoke, Va., died recently.

Walter Williams, engineer for the U. S. Pipe & Foundry Co., East Burlington, N. J., passed away recently.

John J. Raskob, 71, former vice-president of General Motors Corp., Detroit, died Oct. 15.

Bernard Paul Frazer, 43, metallurgist and supervisor of coating laboratories for the Tennessee Coal Iron & Railroad Co., Birmingham, passed away recently.

William Gray, 81, founder of Gray & Davis Co., died Oct. 25.

Dr. Robert E. Doherty, 65, retired president of Carnegie Institute of Technology, passed away Oct. 19.

Sol H. Schachtel, 65, an executive for Luria Bros. & Co., Inc., Philadelphia, died recently.

Julius S. Holl, 64, advertising manager of Link-Belt Co., Chicago, passed away Oct. 24.

YOU'LL NEED A Pension Architect Too!

PLANNING an efficient pension, like planning an efficient plant, requires a good architect. Such a pension architect will supply you with facts and figures on all types of pension plans and will demonstrate the effects on costs of various pension provisions. This advice and counsel based on years of pension experience will save you money and help you select a pension plan that fits *YOUR* business. Before you reach a decision, know the facts!

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On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

Auto industry will resist Washington attempts to cut production . . . Stockpiling seen as serious threat to auto production . . . Packard announces new Navy diesel contract.

By WALTER G. PATTON

To Resist Output Cuts—Strong forces are at work in Washington to cut auto production before the end of the year. The automobile industry will resist such cuts to the limit and will argue: (1) such cuts are unwise and unnecessary, (2) wide-spread unemployment will result, (3) even after Washington has precisely prepared plans for rearmament, there will be long delays before implements of war can go into production.

Achieving a proper balance between war production and auto production will not be easy. The industry's viewpoint was expressed by C. E. Wilson, president of General Motors. Speaking before the American Society for Metals in Chicago recently, Mr. Wilson predicted that government contracts and orders will not absorb 5 pct of the manpower in the automobile industry during the next 6 months or as much as 2 pct (on the average) of the materials being used by industry.

Credit Limits and Cars—The effect of recent credit restrictions on car buying is still not clear. Used car sales are adversely affected. This is generally admitted although some of the decline is seasonal.

Although automobile executives will say nothing officially for publication, it is important to note that objections to the Federal Reserve ruling up to the present time have originated with dealers and finance companies. It is still a fair conclusion new auto sales will not suffer to nearly the extent that dealers are claiming.

Fear of Stockpiling—One of the automobile industry's greatest fears at the moment is that government stockpiling plans will seriously interfere with civilian production. The balance between supply and demand of many materials today is so fine that stockpiling even as much as 10 pct of any commodity may have serious repercussions.

Manpower and Defense — Manpower will be the No. 1 production problem in an allout rearmament program. According to General Motors' figures, it takes only about a quarter as much steel to keep a war production worker employed as it did to keep an automobile worker employed.

Modern mass production industries are constantly finding better equipment and more efficient methods to convert more tons of steel per man per year into civilian products. To the extent that manpower is diverted from civilian production to war production, the pressure on steel and other available materials will be eased.

Plant Labor Trouble—Expectations that auto labor contracts recently negotiated would bring 5 years of labor peace in Detroit are not being realized. Disputes at the top level have been few—as called for in the new contracts. However, labor disputes at the plant level have been numerous. Ford, Hudson, Studebaker, De Soto, and other plants have had serious stoppages.

Union politics have been a factor. This is particularly true at Ford. Detroit has not yet achieved labor peace—despite the fact that the area in which labor disputes can legally occur have been reduced by the new agreements. Many labor experts here fear there will be serious repercussions from labor resulting from production cuts ordered out of Washington.

Packard Diesel Contracts—Last week, Packard announced (after Washington) that the company has received Navy contracts totaling $5 million for Diesel engine development work. Packard's diesel work began back in the early 1920's and included diesel engines for aircraft.

A report that Packard and Buick, in addition to Ford, will build Pratt & Whitney engines is persistent here but unconfirmed.

Gearing for War Works — Defense work in Detroit is quietly increasing. No one knows for sure the proportions this work will ultimately reach. It may be assumed, however, that defense activity will be big business in Detroit by early 1951.

An indication of the growing concern of the auto industry with defense is the announcement last week by Ford Motor Co. of the realignment of its administrative setup for the defense program. Because of expansion of the company's participation in the national defense program, Ford is assigning responsibility for defense products to existing Ford divisions or to new divisions, such as the Aircraft Engine Div., established specifically for the purpose.

Ford's new office of defense products under the direction of R. E. Krafve will be responsible for planning and coordinating the company's defense production program and will have primary responsibility for conducting contract negotiations.

Labor Umpires — The job of a labor umpire is no longer a one-man responsibility at most auto plants. Last week Ford announced the addition of Harry H. Platt, Detroit attorney, to the Ford umpiring staff. Platt will work with Dr. Harry Shulman, Ford-UAW umpire since 1943 and Ronald W. Haughton who was named an umpire earlier this year. Ford indicated the addition to the umpire staff was made to help clear up the backlog of cases currently pending between the company and the union.

Need Longer Work Week — A warning that the country cannot carry a big civilian program and a war program simultaneously unless it works longer hours sounded by C. E. Wilson, of General Motors in Chicago recently has been scorned by the union. Union spokesmen have replied there is nothing in the Federal Wage & Hour Act to prevent industries from working more than a 40-hr week to meet civilian and defense requirements.

While the point was not specifically covered in Mr. Wilson's recommendation of 45-hr week, the union has interpreted this suggestion to mean that auto workers will toil 5 hours more each week without being paid overtime.

Dealer Participation—The question of dealer policy has been a tough one for the automobile industry in recent years. Dealer organizations, working through state and federal agencies, have constantly sought to strengthen their hand in dealing with the big auto manufacturers. Many auto firms, but not all, have dealer councils serving in an advisory capacity.

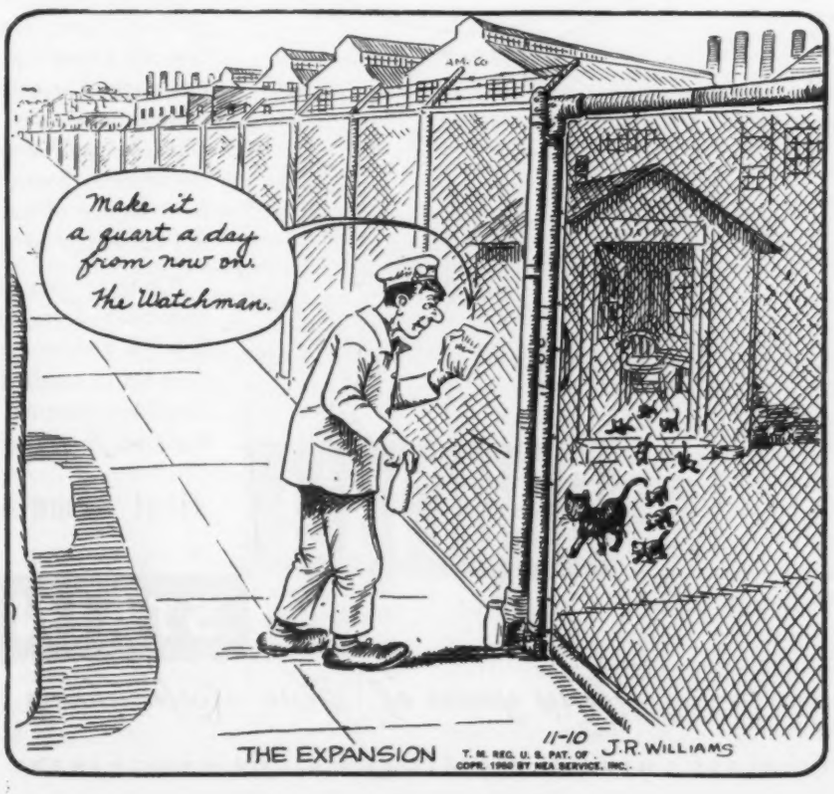
Last week Packard became the first company in the industry to place its dealer advisory council on a completely elective basis. Membership in the council is being increased to 18 dealers (compared with 9 members of the appointed group.) The first meeting will be held in Detroit, November 9. Dealers in each of Packard's major sales zones names one of their members to the council. The committee will concentrate on matters of policy.

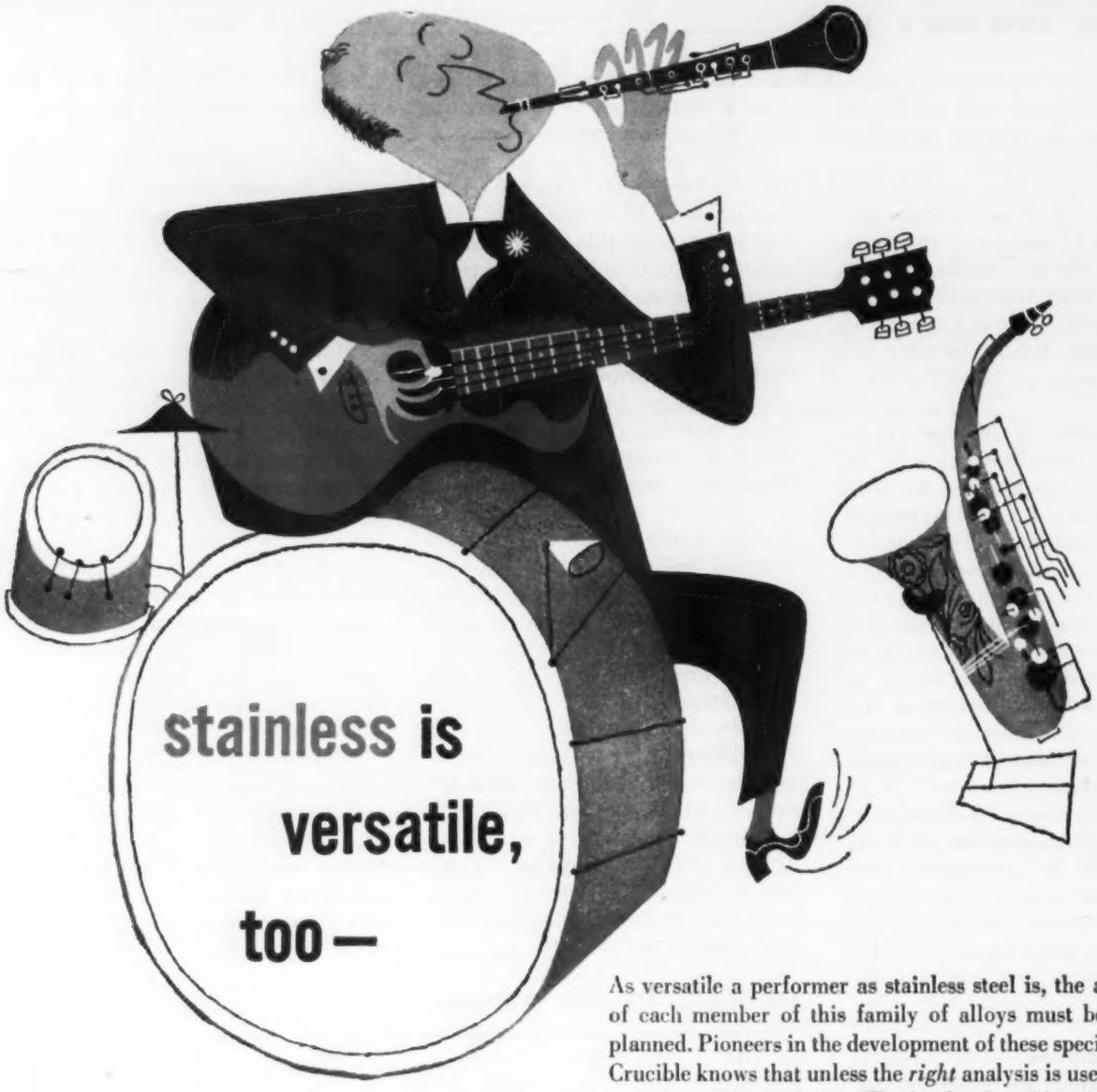
Auto Prices Up? — If a steel price increase follows the current labor negotiations, auto prices will almost certainly be increased as well. Several of the independent car makers have already announced price boosts.

Mercury made no price increase but reduced its dealer discount and revised its standard equipment list downward. Ford pointed out that the company's annual bill for wages and salaries and materials has already increased $78 million due to inflationary forces. In announcing his intention to hold the price line, Henry Ford II made it clear his company is willing to do its part to hold the line against inflation but pointed out that just one company can hardly hope to halt an inflationary spiral.

There is general agreement here that the government can quickly halt the present inflationary spiral. The No. 1 question is: Can Washington revive high production—even with rearmament—if production cuts are made too quickly and in the wrong places?

THE BULL OF THE WOODS — By J. R. Williams





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WEST COAST PROGRESS REPORT

Digest of Far West Industrial Activity—By R. T. REINHARDT

Warehousemen's Lament—Steel inventories of Pacific Coast jobbers have dropped 41 pct in the last 12 months according to Walter F. Doxsey, president, American Steel Warehousemen Assn., who met informally with warehousemen and steel producers in San Francisco last week.

A larger percentage of all steel used in the West is sold through jobbers than nationally. An estimated 18 or 19 pct of all steel sold in the country passes through the hands of jobbers whereas in the Far West about 30 to 35 pct is merchandised in this manner. Therefore curtailments of shipments to warehouses in this area affect a greater percentage of steel users than on a nationai basis.

The Hard Way—One way to get all the steel any western user may need is to have plenty of money and time to travel in Europe, according to Frank Seidelhuber, Jr., president of the Seidelhuber Bronze & Iron Works, Seattle, Wash., who has just returned from a 9-week tour of England and the Continent.

Plenty of patience is also needed. Mr. Seidelhuber cites that he was in Europe 4 weeks before he was in a position to buy a nickel's worth of steel, after which time he made connections which enabled him to proceed with purchases. As a result, the Seidelhuber plant bought 6000 tons of steel in France but only 10 pct of this tonnage can be used by the company because the remainder is of varying gages and sizes unsuited to its needs.

Steel Sells Easily — Mr. Seidelhuber reports no trouble in selling the extra 5400 tons as American buyers were asking for it even before he had completed the transaction. He points out that he has sold this stock at actual cost and has avoided any transactions which might be construed as gray market dealings.

France Is Best Bet—Mr. Seidelhuber states, "The best place to buy sheet steel is from France. England needs all of hers for rebuilding and Germany is just getting in position for export. Some is available in Luxemburg also."

He reports steel selling from domestic mills at 5¢ a lb will run approximately 7½¢ from Europe even though the base price on the Continent is less than our own price. When import duty is added to the price European producers quote for export steel, which is higher than their domestic sales price, the differential amounts to about 2½¢ per lb.

Plate Goes Begging — Aside from sheet steel, European mills are begging for sales with plenty of plate, nails and barbed wire available. He reports plate is being offered at no more than 1¢ per lb higher than U. S. prices.

He also reports that Germany apparently has a considerable amount of aluminum available which is especially interesting to this manufacturer who was just notified that his quota of aluminum will be cut 35 pct based on the June '49 to June '50 period.

Utah Steel Fabricating Triples—Steel fabricating in Utah has more than tripled in volume during the past decade, according to a survey made by the Bureau of Economic and Business Research at the University of Utah. The large part of the growth has taken place since peace-time operations began at the Geneva plant.

As of July 1950 there were 96 fabricating firms employing an average of 2297 workers. The annual payroll was at the rate of $7.5 millions annually. In 1939 there were 28 companies, 853 employees and the payroll was $1.4 millions.

Threat to Scrap — M. F. Berg, principal in Berg Metals Corp. of Los Angeles, in the keynote speech of the meeting before the 125 delegates, stated that one of the most important threats to all-out producion in scrap yards probably would be lack of manpower. He also called for a close inspection of present operating procedures and policies to alleviate what he termed the threat of government controls which would seriously hamper dealers' activities.

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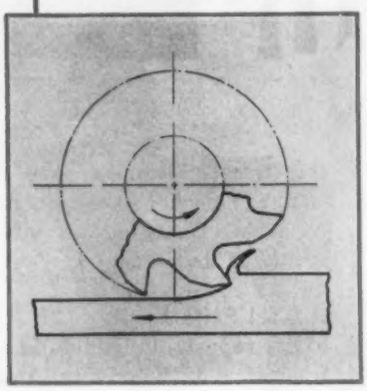

Down-milling cut. You'll find this of value in two cases: 1) thin parts, difficult to clamp; 2) where breakout of metal at the end of the cut cannot be tolerated. CINCINNATI High Power and Dual Power Dial Types handle operations like these.

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THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

By EUGENE J. HARDY

Metalworking Form Coming—In the works at the National Production Authority is the first major form which metalworking plants will have to file regularly. Similar to the old WPB "input-output" form, it is designed to give NPA complete data on materials input, man-hours worked, and output by product. The form has been discussed with industry representatives. Data on the fourth quarter of 1950 by Jan. 25, 1951, is the present target. Filing of the form will be on a regular quarterly basis thereafter. In addition to data on manpower, shipments, volume of rated orders, etc., metalworking plants will be asked to estimate the value of shipments during the second quarter of 1951.

Data compiled from this form will be used to check on the effectiveness of inventory control, but most important to NPA is that it will provide an accurate picture of the use of critical materials. Described as a "toughie", this will be the first of many forms to come if the Administration plans to carry through its 4-year rearmament program now being discussed by Defense Secretary Marshall.

Capacity Report Coming—Power-grabbing W. Stuart Symington, National Security Resources Board Chairman, will soon have support for his views on further expansion of steel capacity from a key Congressional committee.

The Preparedness Subcommittee of the Senate Armed Services Committee—a 1950 version of the World War II Truman Committee—will soon report on the "inadequacy" of capacity and is expected to call for an immediate program of further expansion.

It is reasonably certain Mr. Symington will seize upon the report as an excuse for further scolding of the steel industry for "shortsightedness."

Straw in the Wind—A straw in the wind came last week from Sen. Lyndon Johnson, D., Texas, subcommittee head, in his blast against sales and distribution policies for oil pipe. "Reputable oil men—desperate for pipe to protect their leases—are now having to pay $2 to $3 per foot on the gray market for casing, while the published price is around $1.25 per foot," Johnson charged. Then he fired these questions: "Is anybody stockpiling it? Is anyone hoarding for a better price, or diverting for better profits?"

Broad Amortization Powers—Mr. Symington will have a great deal to say about the who, when, and where of certificates approving 5-year writeoff of defense plants and facilities. The regulations under which Mr. Symington will hand out these certificates have been described in some quarters as a "blueprint for socialism."

This may not be completely accurate, but there is no doubt that the regulations give Mr. Symington far more power than is actually needed for granting tax benefits to firms expanding for war purposes.

Can Deny Writeoff—In the regulations Mr. Symington has assigned himself the right to deny the fast writeoff if it does not foster competition, or if NSRB feels a firm's management incompetent or its financing unsound. NSRB will have the final say on location and will determine probable economic usefulness of the plant in question for other than defense purposes after 5 years.

Basically, the regulations permit issuance of certificates in industries not only where there are existing shortages but even prospective shortages. Stand-by plants could also be approved.

Maybe, Mr. Symington couldn't quite build another TVA under this authority, but he could try. He could also have a large say in the location of future industrial expansion and soothe the politicians who have been fighting for such things as a New England steel mill.

Leaping Before Looking?—There are indications some planners are moving too quickly—that control action is sometimes taken before the effect of the proposed order on the economy is known. This policy could only result in loss of industry support for the program and a tearing down of prestige for NPA Administrator Harrison.

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The addition of the S. S. Wilfred Sykes to Inland's iron ore fleet is just one more step in a continuous modernization and expansion program. This constant improvement of every phase of steelmaking facilities is further evidence that Midwest steel users can put their confidence in Inland as a progressive and dependable source of steel in peace and war.

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New Lathes Bore and Rough Turn at Record Rates

By C. W. HEPPENSTALL
Vice-President,
Heppenstall Co.,
Pittsburgh

ROUGH turning and boring of forgings at rates greatly in excess of current American practice are possible with two machine tools to be made available in this country within the next few months. Though because of their expense and specialized application, relatively few plants in this country may be interested in purchase of these machines, the effects of their application will be of widespread industrial importance.

The machines were designed and built in Germany, but the startling production figures reported in Tables I and II were obtained in operations at the plant of Walter Somers, Ltd., in England, where important work on the tooling and use of these machines has been done. Detailed drawings and the right to manufacture, sell, and use these machines in the United States have been purchased by the Heppenstall Co., Pittsburgh.

Probably the more important of the two machines is the trepanning lathe illustrated in Fig. 1. Utilizing carbide-tipped tools, this machine is capable of making holes in forgings at a minimum rate of 24 ft per hr, at least 20 times faster

Two lathes, developed in Germany and shortly to be built in this country, operate at rates well in excess of current American practice. A trepanning lathe bores holes in forgings at rates as high as 41 ft per hr. A rough turning lathe can remove metal at rates up to 2000 lb per hr in forgings up to 33 ft long.

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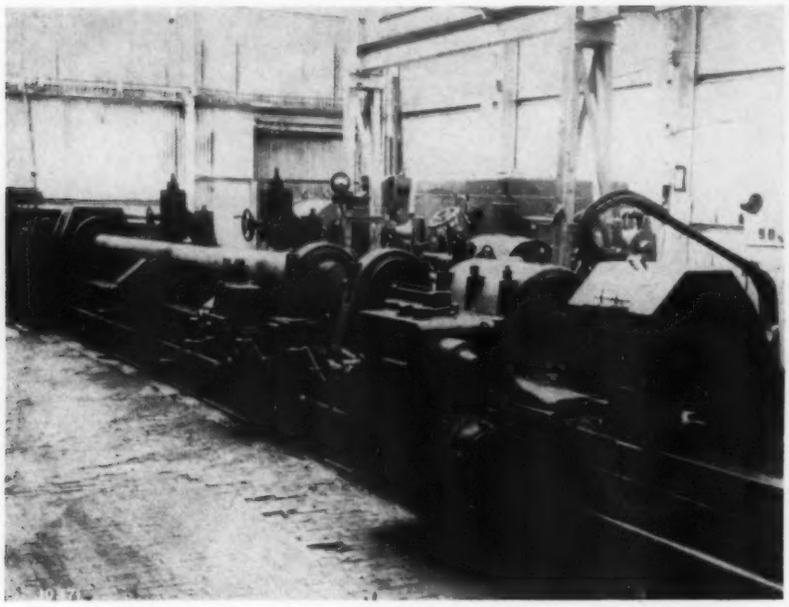

FIG. 1—This trepanning lathe, shown in operation in a British plant, can handle forgings up to 33 ft long, and bore holes up to 20 times faster than current American practice.

than the rate at which this work is commonly done in this country. In one of the runs reported in Table I, a rate of penetration of 41 ft per hr was achieved, and there is no reason to assume that this is an absolute maximum.

This machine should find important application on such work as boring gun barrels, gun housings, gear forgings, oil field drill collars, and turbine and generator rotor forgings. The floor-to-floor time for boring inspection holes in large generator rotors, for example, is commonly as long as four full 8-hr shifts. The economy of being able to do the same job in 1 to 2 hr is obvious.

The lathe as it will be modified to meet U.S. standards and requirements, is capable of handling workpieces up to 33 ft in length, 30 in. in diam, and 35,000 lb in weight.

It will be equipped with a 75 hp, 400/1600 rpm, dc motor. Through change gears, work will be driven at from 20 to 900 rpm, with a maximum torque at the spindle of 53,000 in-lb at low speed. A Ward-Leonard type of variable speed drive might, however, be used.

Through special gear sets, feeds of the trepanning tool can be varied from 0.002 to 0.600 in. per rev at spindle speeds from 20 to 600 rpm, and from 0.0015 to 0.400 in. per rev for speeds of 600 to 900 rpm.

An auxiliary motor drive is provided for withdrawal of the trepanning tube at a maximum speed of 100 ipm.

The machine is capable of trepanning holes from 1¾ to 15 in. in diam. The trepanning head carries but one tool, in contrast to the multi-tool heads often employed in this country. The tool is designed with special attention to efficient breaking up of chips. High coolant pressure also contributes to chip breakage and removal. Coolant is furnished through a groove at the periphery of the head.

It is expected that the principles of this lathe will be first utilized in this country on a Heppenstall rough turning lathe, which is being rebuilt to demonstrate this trepanning technique.

The second machine, illustrated in Fig. 2, is a special rough turning lathe capable of removing metal at a rate of 2000 lb per hr. It can handle workpieces up to 33 ft long, 30 in. diam, and 50,000 lb in weight.

Probably the outstanding design feature of this lathe is the use of three front tool carriages, each mounting two cutting tools when the full capacity of the lathe is being utilized. Longitudinal feeds of the tools vary from 0.016 to 0.160 in. per rev, steplessly in three overlapping ranges which

TABLE I

TREPANNING LATHE PERFORMANCE

	1	2
Length trepanned	23 ft 5¾ in.	70 in.
Diam of bore, in.	3.010	3.012
Diam of core, in.	1.000	1.572
Speed, rpm	700	850
Feed, in. per rev	0.027	0.0344
Net time, min.	57	51½
Rate of penetration, ft per hr	24	41
Max. peripheral cutting speed, sfpm	550	670
Eccentricity at finish of cut, in. centers		0.0005

Material—Nickel-Chrome-Moly Steel, 112,500 psi tensile strength

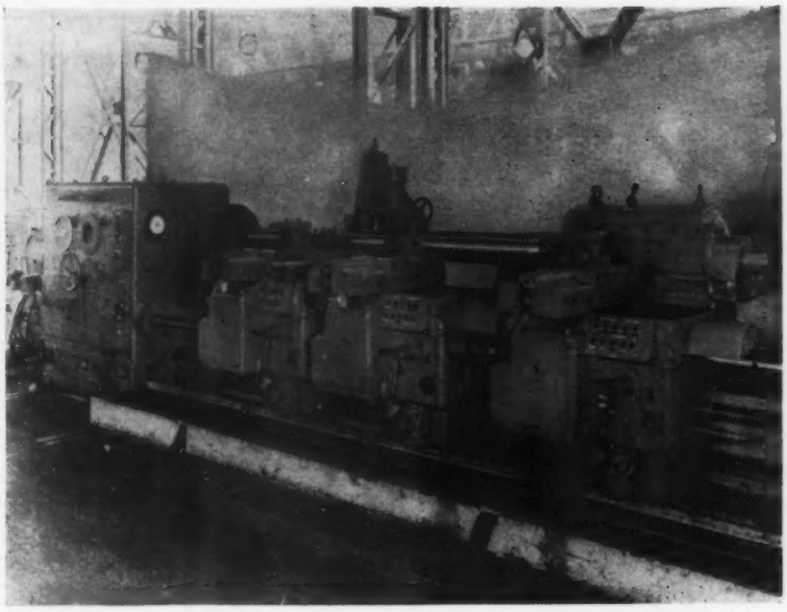

FIG. 2—Three front tool slides, each mounting two tools, can be brought into operation on this rough turning lathe. Metal can be removed at a rate of 2000 lb per hr.

make up this total range. Rapid traverse of 120 ipm is provided. Each carriage has a complete set of controls.

The lathe will be equipped with a 125/150 hp, dc motor. Through change gears, work can be driven at 9.2 to 275 rpm, with a maximum torque at low speed of 265,000 in-lb.

Tool mounting is accomplished in such a manner that tools may be pre-set, thus setup in the machine is greatly simplified and speeded. The machine is designed so that contour machining can be used.

In the production figures reported in Table II, only two cutting tools were being used. It is estimated that with all three carriages in use, metal can be removed at a rate of approximately 2000 lb per hr.

Both of these machines will be equipped with hardened steel ways, centralized controls and automatic chip removal conveyers. In addition, Heppenstall's recently developed Twingage will be utilized. This is a gage which gives the operator of a machine a visual indication for checking whether or not he is maintaining correct surface speed at the point of the cutting tool, and whether his depth of cut and feed are such that the maximum power of the machine's motor is being

TABLE II

ROUGH TURNING LATHE PERFORMANCE

Approximate speed	88 rpm
Approximate feed	0.0377 in. per rev
Max. cutting speed	241.9 sfpm
Depth of cut	0.5 in.
Total metal removed	1570 cu in.
Time	18 min
Metal removed per min	87.2 cu in.
Metal removed per hr	1480 lb

Material—Nickel-Chrome-Moly Steel, 135,000 psi tensile strength

New Books

"Handbook of Material Handling With Industrial Trucks," a practical guide for the analysis of material handling operations. Sections of the book describe the various types of industrial trucks in use; their integration of operation with other material handling systems; unit load determinations and patterns; how to charge and change storage batteries and keep battery records. Electrical Industrial Truck Assn., Dept. PR, 3701 N. Broad St., Philadelphia 40. $1.00. 72 p.

"Resistance Welding—Designing, Tooling and Applications," by W. A. Stanley. Reflecting the experience of hundreds of leading shops, the book explains resistance welding from A to Z —what it is; the equipment and materials used; the design, tooling and production techniques that afford big savings in materials, costs, manpower. McGraw-Hill Book Co., 330 W. 42nd St., New York 18. $7.50. 330 p.

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How to Evaluate

By S. EPSTEIN and J. W. FRAME
Research Engineers, Research Dept., Bethlehem Steel Co., Bethlehem, Pa.

A WHOLLY satisfactory test for determining the drawability of sheet steel has not yet been developed. The prime requirement is a high degree of ductility. For a severe draw over a large section as at the nose of a fender the elongation in a tensile test obviously bears a relation to the drawability.

However, the governing criterion for the drawability of a large stamping like a fender is not the total elongation but the uniform elongation. This is the elongation before necking down of the tensile specimen begins. Obviously the elongation after necking down starts will be of practically no help in making the draw.

Uniform Elongation Hard to Measure

In the usual rather short 2 in. gage length tensile specimen of steel sheet, the localized elongation after necking down begins represents a considerable part of the total elongation. Thus a certain lot of sheet steel which shows a high total elongation in the usual tensile test may nevertheless have relatively low uniform elongation. With the ordinary short tensile test specimen it is very difficult to determine accurately the uniform elongation, either by direct measurement or by special calculations.

With a very long tensile specimen, a gage length of 12 in., there would be no difficulty in directly measuring the uniform elongation, for it would be practically the same as the total elongation. In such a long sample the localized elongation after necking begins would be a small part of the total elongation. The difficulty, however, with using a very long sheet steel tensile sample is that it is impractical to apply a uniform tensional load to such a sample.

This difficulty can be overcome by using instead of a tensile test a large bulge test, similar to the Olsen cup test, but very much larger. In this way the uniform elongation can be measured directly. In the bulge test as in the Olsen cup test there is an added advantage that the sheet is tested transversely as well as longitudinally.

In the bulge test a large circular disk of sheet steel is held down around its circumference by a hold down ring. The test region of the disk, 14 in. in diam, is then bulged by oil pressure until it bursts. The amount of stretch in the upper region of the bulge after bursting is measured. This is the uniform elongation as determined in the bulge test. Fig. 1 shows such a bulge tester with a bursted specimen in place after testing.

FIG. 1—Bulge tester used to test drawability of sheets.

BULGE TEST RESULTS

	Hardness Test	Tensile Test				Bulge Test
	Rockwell B	Yield Strength, P.S.I.	Tensile Strength, P.S.I.	Total Elongation, pct	Olsen Cup Test Depth in inches	Uniform Elongation in the 6 in. Circle at the Top of the Bulge, pct
Lot A	38	23,750	45,700	40	.428	47
Lot B	38	22,050	44,710	40½	.428	36

Deep Drawing Quality Steel

New tests for drawing quality come closer to evaluating drawing quality than those used heretofore. Uniform elongation is much more important than total elongation on the drawability of large stampings. Microstructures, inclusions and alloy residuals effect on drawability. Bulge test results are correlated with drawability.

The table on p. 88 shows some interesting data on two lots of steel tested by the bulge test. Although the hardness, tensile properties and the Olsen cup tests of the two lots of steel were identical the bulge test showed a very marked difference between them.

Both lots were aluminum-killed steel and had about the same microstructure with the usual rather coarse elongated as-annealed grain. However, it was observed that in lot B, with the poor bulge test results, the carbides tended to be arranged in line instead of being uniformly distributed as in lot A which gave the good bulge test results. This is illustrated in Fig. 2.

Lot A with the good bulge test results was hot rolled to give the normal high finishing temperature of the hot band. The hot band of lot B with the poor bulge test results had a somewhat low finishing temperature. It has been observed that such steel hot rolled to give a low finishing temperature tends to give rather poor performance in deep drawing.

Magnetic tests made on the two lots of steel A and B also differentiated strongly between them. In these tests a torque magnetometer was used. A small disk (1 in. in diam) of the sheet steel is suspended by a wire so that the surface is in a horizontal position between the poles of the magnet. The rolling direction of the sheet from which this disk sample is taken is indicated in the disk. In ordinary cold-reduced and annealed sheet steel preferred orientations of the elementary crystallites exist which cause the sheet to be more easily magnetized in certain directions.

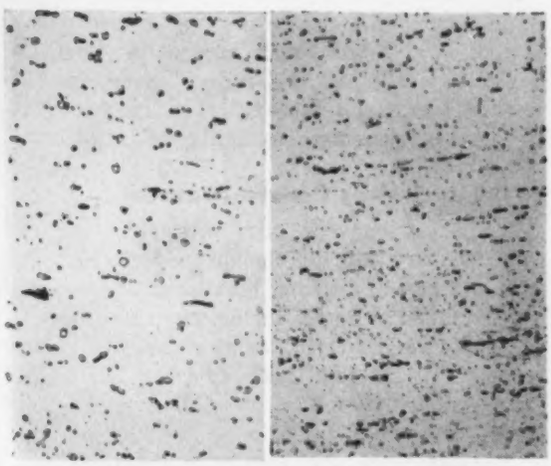

FIG. 2—Carbide distribution in cold rolled, box annealed sheets. Mag. 330X. Photo on left is typical of random distribution; photo on right shows "in line" distribution.

Dials Register Twisting Force

The test disk is now set between the pole pieces of the magnet so that the rolling direction is at various angles to the north-south line of the magnet. If the disk is so placed that the direction of easy magnetization of the steel either coincides with or is perpendicular to the north-south line of the magnet, then the disk will have no tendency to rotate or twist in its suspension. The dials at each end of the suspension will show a zero reading for the twisting force. However, if the disk is so placed that there is some other angle between the north-south line of the magnet and the direction of easy magnetization of the disk, then there will be a tendency for the disk to rotate or twist in its suspension as it strives to align itself with the north-south direction of the magnet. The two dials at each end of the suspension will then register a twisting force.

Test results of this sort on the two lots of steel A and B are shown in Fig. 3. The wave-like magnetometer curve of the amount of twist plotted against the angle between the rolling direction of the disk and the north-south direction of the magnet contains four loops in lot A and only two loops in lot B.

An explanation for this is indicated in Fig. 4. In lot A the preferred orientation of the elemen-

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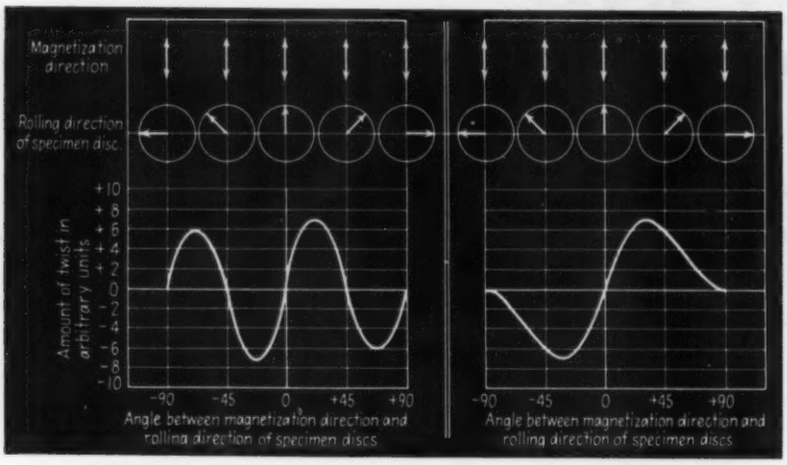

FIG. 3—Torque magnetometer curves on test lots A and B. Good bulge tests were obtained on lot A, curve at the left. The poor bulge tests on lot B produced the magnetometer curve shown at the right.

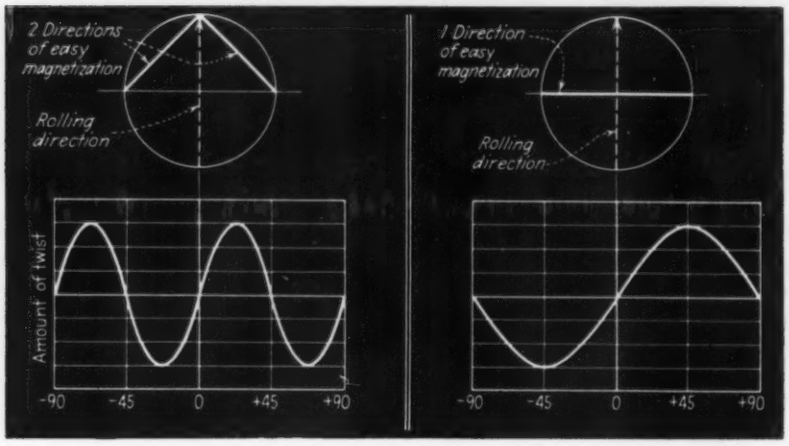

FIG. 4—Preferred orientation where there are two directions of easy magnetization is depicted at left, for lot A. At the right the preferred orientation produces only one direction of easy magnetization.

tary crystallites of the iron in the sheet is assumed to be such that there are in the main two directions of easy magnetization, as shown in the circle above the magnetometer curve. As the disk represented by this circle is rotated through various angles, the wave-like curve for the amount of twist will have four loops as indicated. In lot B only one direction of easy magnetization is indicated. In this case the wave-like magnetometer curves for the amount of twist as the disk is rotated through various angles will have only two loops, as indicated.

Lot A was differentiated from lot B by the bulge tests, lot A showing good results and lot B poor results. Lot A was hot rolled to finish at the normal high finishing temperature, whereas lot B finished at a somewhat lower temperature. Good bulge test results were shown by the steel treated according to normal good practice.

The microstructure, particularly the arrangement of the carbides, also indicated a difference between the two lots. Likewise the magnetometer tests did so, indicating a difference between the preferred orientation of the elementary crystallites.

A deep-drawing sheet is elongated so that it becomes about 500 times as long as the original ingot. It is therefore remarkable that in the finished sheet there is so little difference between the properties parallel to the direction of rolling and across the direction of rolling. Such differences are almost indistinguishable by means of a tensile test, either in the yield or tensile strength or in the elongation. In a cupping test such as the Olsen test the break may occur more frequently parallel to the rolling direction. The cause of this can frequently be traced to the presence of elongated segregates of inclusions.

Inclusions Reduce Drawability

A sheet with very good properties, as indicated by the hardness, elongation and grain size, may still fail in drawing because of the presence of inclusions. Some inclusions are generally segregated and distributed at random in various parts of the different ingots of a heat. The effect of inclusions may not be revealed by normal testing procedures.

The inclusions are usually in the interior of the sheet where they cannot be detected by visual inspection and are only revealed when the part is drawn. It is impossible to make steel entirely

free of inclusions but the amount of inclusions can be held to a minimum by careful steelmaking practice. Since it is very difficult to identify inclusions in such a manner as to establish their source positively, the best that can usually be done in eliminating inclusions is to set up preferred practices based on previous experience. The possibilities of utilizing radioactive tracer elements in identifying and establishing the source of inclusions are being considered.

Figs. 5 and 6 illustrate typical defects in steel caused by inclusions. Fig. 5 shows crescent type defects in a drawn tub caused by deep seated interior segregates of elongated inclusions sometimes termed laminations. The crescent defects showed through on both sides of the wall of the tub, that is on the inner surface as well as on the outer surface.

Laminations Show In Final Product

Fig. 6 illustrates how laminations in different parts of the circular blank will appear in the drawn tub. Lamination 1 in the center of the circular blank will appear as a straight line along the length of the tub. A lamination like 1, that is centrally located in the sheet, may arise from the presence of a central pipe in the steel. Laminations 2 and 3 toward the edges of the circular blank will be slanted circumferentially toward the rim of the tub and thus assume a crescent shape. Laminations of this sort nearer the edges of the sheet are usually away from the middle of the thickness toward one surface.

FIG. 5—Crescent shaped defects in drawn tub caused by elongated segregates of inclusions.

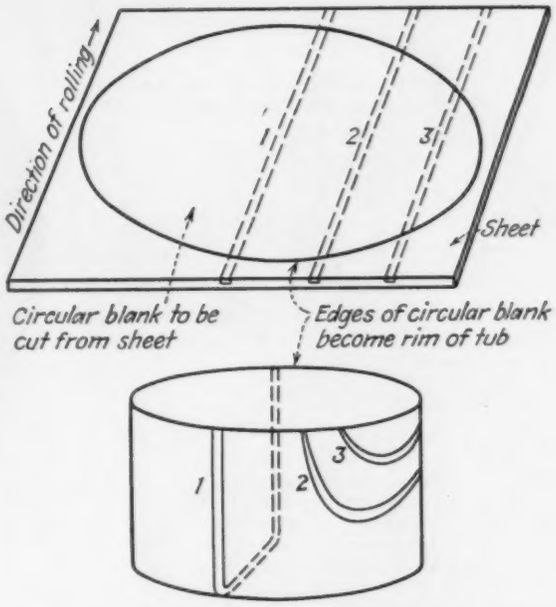

FIG. 6—Schematic relations between locations of laminations in the blank and crescent defects in the part.

Slivers differ from laminations in being a surface defect rather than an interior defect. They are caused by segregates of inclusions very near the surface. Slivers differ from laminations in that they can usually be noted by visual inspection, although even these surface defects are sometimes hard to detect, sometimes appearing on the finished sheet as only a slight discoloration. Slivers may sometimes be several feet in length.

Fig. 7 shows a photograph of slivers in the stamping for a washing machine tub; some of the slivers are indicated by arrows. The steel was aluminum-killed steel. As shown in Fig. 8 the slivers were caused by aluminum-oxide inclusions at the surface of the aluminum-killed steel, within the zone of the sliver.

These examples of defects and their relationship to inclusions have been described because an understanding of them may be helpful in eliminating or avoiding defects and in deciding what sort of steel may be preferable for a particular job.

Effect of Incidental or Residual Elements

In the composition of deep-drawing steel the principal element besides iron are carbon, manganese, phosphorus and sulfur. In general, the carbon, phosphorus and sulfur are kept low because they have a hardening effect. The manganese is also kept rather low for the same reason, although about 0.3 pct Mn is used to obtain the best hot-rolling properties and grain size.

Now the content of these elements can be held under control in the steelmaking process. However, there are elements such as copper, tin, nickel and molybdenum, for example, which cannot be eliminated in the steelmaking process and

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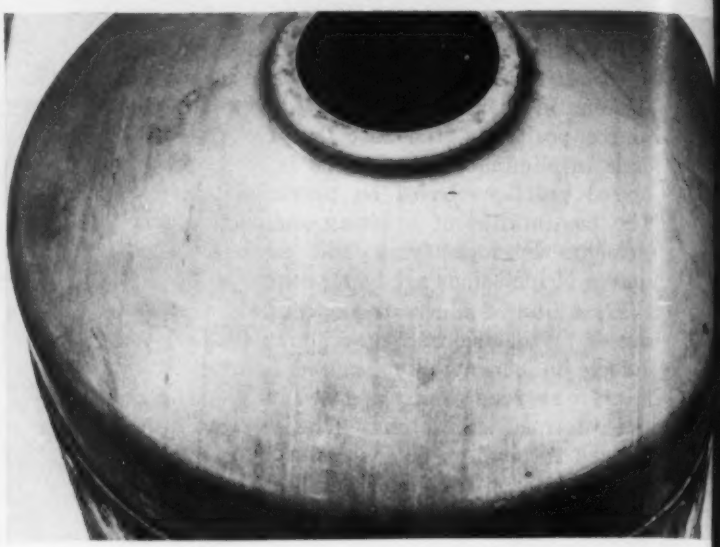
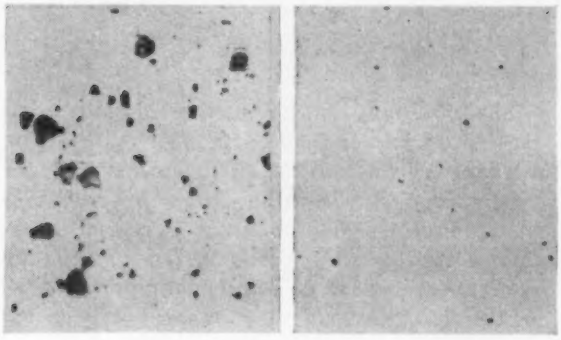


FIG. 7—Slivers in a tub drawn in aluminum-killed steel. (Half size).

FIG. 8—Aluminum oxide inclusions at the surface of the sliver defects shown in Fig. 7 are shown at the left. The absence of inclusions in the same polished sample but outside the sliver is shown at the right. Max. 250X.



copper, nickel and molybdenum on the hardness and tensile properties of deep-drawing sheet steel. The effects of each of these elements up to contents of 0.4 pct are shown, although in actuality such high contents are practically never encountered in producing deep-drawing steel. The total of the contents of all three of these elements is usually held below 0.15 pct.

Residuals Decrease Ductility

Each of these elements tends to raise the hardness and tensile strength and lower the elongation. However, in general their effect is only

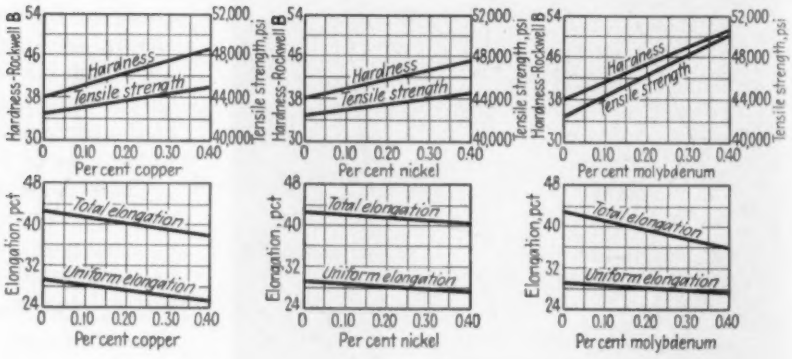
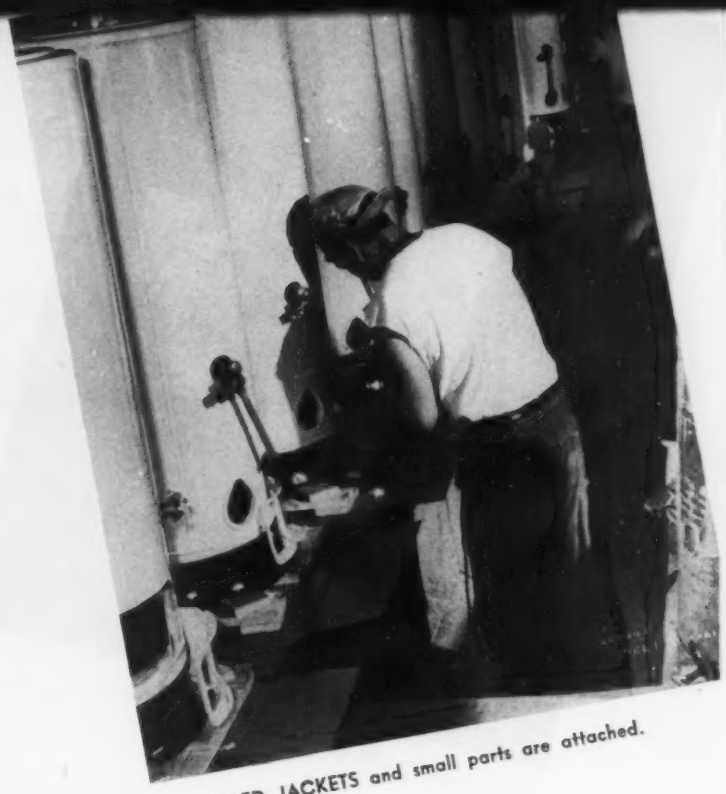


FIG. 9—Effect of incidental elements on the hardness and tensile properties of deep-drawing sheets.

hence cannot be controlled in refining the steel. These elements generally come with the scrap charged in the steelmaking furnaces and are called incidental or residual elements. The contents of incidental elements in the scrap have tended to rise with the increases in the production of alloy steel. In general the incidental elements have a hardening effect and they may also injure the hot-rolling properties. Every effort is, therefore, made in the production of deep-drawing steel to keep the content of incidental elements to a minimum.

In Fig. 9 are illustrated the effects of incidental very gradual and mild. Nickel has a somewhat smaller effect in increasing the hardness and decreasing the elongation than does copper. The effect of nickel in decreasing the uniform elongation is seen to be so small that it is almost negligible, in contents below 0.1 pct as are usually encountered. Molybdenum has a very marked hardening effect, but as may be seen in Fig. 9, its effect on the uniform elongation does not appear to be much greater than that of nickel. This suggests that it would be of interest to study further the effect of molybdenum on the deep-drawing properties and this is being done.

STEEL TANKS are placed on paper and wood base.



ENAMELED JACKETS and small parts are attached.

PAPERBOARD PACKAGING REDUCES SHIPPING DAMAGE

By **WALTER J. RUSIN**, General Foreman, Hot Water Div., Harrison Steel Cabinet Co., Chicago

BY packing its hot water heaters in corrugated paperboard boxes instead of wooden crates, the Harrison Steel Cabinet Co., Chicago, has reduced packaging costs 20 pct and damage claims by more than 80 pct. The use of corrugated boxes was initiated in April 1950. Now, the company is using them for all of its water heaters weighing up to 350 lb. The interstate commerce rules don't permit paperboard packaging of heaters over 350 lb.

To appreciate why Harrison switched to corrugated boxes for shipping water heaters, it is helpful to know the problems that confronted the firm when they were using wooden crates. Two full-time carpenters were kept busy sawing lumber. This meant paying skilled men for work that was not in any way connected with the primary job of manufacturing water heaters. It meant, too, that valuable plant space had to be set aside for a carpenter shop and for storing lumber.

Assembling the lumber into wooden crates was complicated by the fact that slats couldn't be nailed together while resting on the floor-level conveyer. Pounding nails into the crates pushed them off the conveyer. Thus, each heater had to be removed from the conveyer before being crated. After crates were placed around the heaters, they had to be hand stenciled to carry the necessary product identification.

No one would have objected to the time and labor involved if the crates had protected their contents. However, even before heaters left the shipping room, damages were common. It was quite often found that the white enameled jackets of heaters were scratched or dented by hand truck handles which fell between slats of crates. In addition, the white jackets of the heaters were always exposed to dust and dirt while in transit to warehouses. These problems have been eliminated since the firm began shipping its heaters in corrguated boxes.

Working with packaging consultants of the Stone Container Corp., the company made some major improvements on the first corrugated box used. Stone's packaging experts showed how to eliminate the use of steel banding tape on the top of each box. As shown in the photographs, the present box is banded with steel tape only at the bottom. The top flaps are sealed with paper tape. Obviously, paper tape is cheaper and easier to use than steel tape.

Harrison advertising men and Stone Container designers created the printed advertising and product description that appears on the current box. This printed material has eliminated time-consuming hand stenciling.

The basic steps of finishing and packaging the

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PROTECTIVE SHIPPING containers are slipped on.

BOTTOM FLAPS are fastened with steel bands.

Paperboard Packaging

Continued

hot water heaters are as follows: First, bare steel tanks are delivered to the front end of the floor-level conveyer. Here the tanks are placed on bases of wood and corrugated paperboard. The bases are the only places in which wood is used. The second step is putting on enameled jackets and attaching small parts to the heaters. At the end of the line, while heaters are still on the conveyer, corrugated boxes are slipped over them. The boxes are then sealed, removed from the conveyer and carted back to the shipping room.

As can be seen, the heaters are completely enclosed by protective corrugated paperboard. Dust and dirt cannot seep into boxes to spoil the white finishes of the heaters' jackets. Damage is no longer a problem. In 6 months, there have been only two heaters damaged.

What little sawing of wood is necessary is done by one man a few minutes each day. Also, huge stacks of lumber no longer obstruct plant traffic. All of the corrugated boxes are stored on a loft that is easily accessible to the assembly line. Taking inventory is simplified because there is no longer any need to estimate how many boxes a particular pile of lumber will make. In contrast, it is easy to keep a running record of corrugated boxes on hand.

Men on the line now seldom scratch or get slivers in their hands. Sales and advertising departments are pleased with the new boxes because of their "traveling billboard," effect. Tests showed that printed advertising on the paperboard boxes is more than four times as readable as that which appeared on the wooden crates.

PACKAGED UNITS are carted to the shipping room.

Metalworking Research Reaches All-Time High

SOUTHERN RESEARCH INSTITUTE
—Second of a Series—

By W. W. AUSTIN, Jr. and PEYTON WHEELER
Senior Metallurgist Head, Protective Finishes Section
Southern Research Institute, Birmingham

Founded in 1945, Southern's rapid growth is indicative of industry's need for outside research. Additional facilities are being added for metals, ceramics and protective coatings. Foundry and related items are a big part of Southern's volume. Many small companies in the area lean on this Institute for help in solving their theoretical, as well as practical problems.

SOUTHERN Research Institute was organized by a group of southern businessmen in 1941 as a nonprofit organization to provide scientific personnel and equipment for use by industry in general. Due to wartime shortages, however, actual laboratory operations were postponed until 1945. While metallurgical research is but one phase of the Institute's widely diversified research program, its facilities for serving the metal industry are being constantly expanded and improved.

Southern Research Institute has been endowed by the contributions of more than 500 companies and philanthropic individuals. These contributions amounting to some $2 million are placed in a capital fund for the purpose of providing laboratory buildings and equipment for the Institute's operations. Operating costs are paid out of current income from sponsored research projects, and are not charged against the capital fund. In this way sponsoring companies gain the distinct advantage of having extensive laboratory facilities made available to them merely for the cost of their operation. Moreover, technical experts in many fields are employed on the Institute's staff. The fact that any or all of these men may be brought together at short notice for collaboration on a given sponsor's problem is of inestimable value in making the most efficient and effective approach to many problems daily encountered.

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Continued

During the current fiscal year more than $90,000 of the operating budget is being expended for research projects on metals, ceramics and protective coatings for metals. These projects will require the services of 10 to 12 technical employees.

Since the opening of its laboratories in 1945, Southern Research Institute has handled each year an average of seven different research projects in metallurgy and related fields. The total dollar volume of these projects has amounted to more than $250,000, averaging slightly more than $40,000 per year. The graph shows the growth of metallurgical research during the period 1945-50.

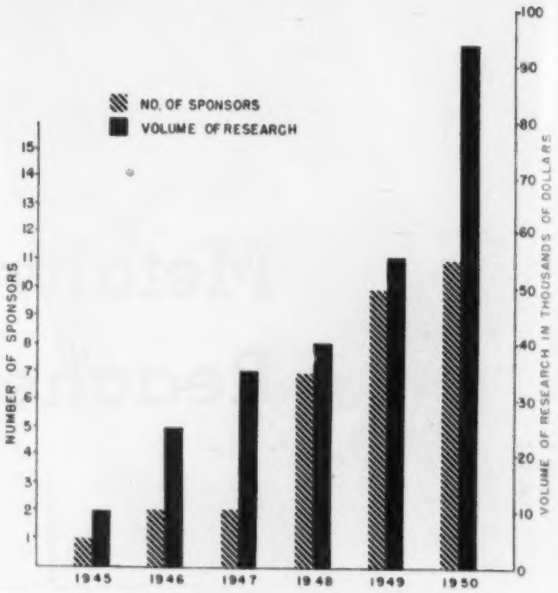
The average cost of these research projects, exclusive of government contracts, has been $11,500 with individual project expenditures ranging from $100 to $85,000. Sponsors representing almost every phase of industrial activity from inventive-minded individuals, small and large manufacturers, railroads and steamship lines, to nation-wide trade associations and government agencies, have been served. While accurate data on the size of the sponsors' companies are not available, a majority carry AAA or AAAA ratings in the Thomas Register.

As a nonprofit industrial research institute, Southern Research Institute can most effectively serve industry through the planning and execution of long-range research programs tailored to fit the needs of the individual sponsor. This type of research includes such subjects as product development and improvement, byproduct and waste utilization, or the investigation of new applications for existing materials and processes. Long-term research programs of this type are normally conducted on an annual basis subject to periodic review and appraisal by the sponsor. The scope of such projects may be extended or curtailed according to the sponsor's wishes.

Typical Research Projects

Frequently, smaller concerns having no research facilities of their own find it profitable to avail themselves of the Institute's services for short-term projects in order to iron out production difficulties. Although sound operating economics will not permit an excessive number of such temporary projects, the Institute recognizes a certain responsibility in providing technical counsel and "know-how" to smaller industries in its vicinity.

A typical small project involved the testing of bearings and pillow block assemblies in order to ascertain their operating efficiency under the adverse conditions to be encountered in marine atmospheres. The bearing assemblies complete with shaft were hung in the salt fog cabinet



Growth of Research in Metallurgy and Related Fields at the Southern Research Institute

maintained at a temperature of 92° to 96°F, where they were exposed to a dense salt fog created by atomizing a 20 pct solution of NaCl with preheated air.

At 24-hr intervals the bearings were removed and examined for signs of corrosion or any tendencies for the bearing to become immobile from the attack of salt atmosphere and water.

This procedure was followed for 300 hr, at which time a slight tendency to freeze was noticed. The bearings were then removed and cross-sectioned on a high-speed abrasive cutoff saw in order that the surfaces of the balls, races and shafting could be observed. Color photographs illustrating the conditions noted, were included in the final report to the sponsor.

A typical long-term research project is the work done for the Woodward Iron Co., of Woodward, Ala., on the improvement of machinability in high phosphorus gray cast iron. This project, carried out over a period of 4 years, has involved the fundamental study of the harmful effects of phosphorus upon the machinability of gray cast iron castings, and an investigation of ways and means of overcoming these adverse effects through annealing and/or alloy additions to the molten iron.

Similar long-term reasearch projects have been conducted on problems ranging from the evaluation of engineering properties of nodular graphite cast iron, the study of the effectiveness of various alloying agents as substitutes for manganese in steelmaking, to the development of special abrasion resistant paint films, and the design of materials handling equipment for shipboard application.

In all of its research programs, Southern Research Institute constantly strives to maintain a close relationship with its sponsors. Frequent

progress reports and periodic reviews of results by sponsors' representatives have been found to result in more effective application of effort, often shortening considerably the time required to arrive at a satisfactory solution to the problem.

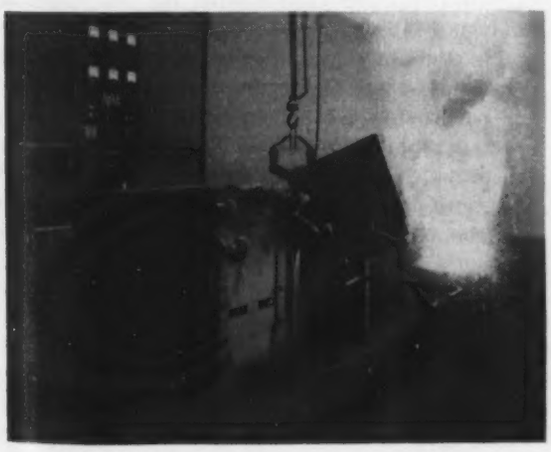
Companies of 100 Men or Less Do Research

In one case a small jobbing foundry producing gray iron castings found it desirable to expand its production facilities to include a certain grade of pearlitic malleable castings. Having no previous experience in this field, the foundry owner was anxious to obtain practical information concerning melting and annealing practice as well as mechanical properties obtainable from the raw materials available to him.

In carrying out a research project to obtain the required data, a series of experimental heats was produced from pig iron and scrap selected and supplied by the sponsor. Charges were adjusted to give the desired chemical analysis and numerous test specimens were cast. An experimental study of annealing treatments led to the establishment of the optimum annealing cycle for producing tensile properties well in excess of the specified minimum values.

While the total time required for this project was less than 2 months, the results provided the sponsor with information for purchasing the necessary equipment and setting up to produce the new material with a minimum of delay and experimentation in his foundry.

Another interesting example of a short-term research project conducted for a small industrial plant involved an investigation of the cause of rusting on freshly painted garment hangers. The hangers, fabricated from plain carbon steel wire, were processed on a conveyer which carried them through a "burn-off" oven, an enamel dip tank, and a baking oven. The purpose of the "burn-off" oven, a key factor in the solution of the problem, was to volatize the drawing compound used in forming the wire. Its temperature was maintained at approximately 700°F.



MAGNESIUM ALLOY being added to molten iron during an investigation of the properties of nodular graphite cast iron. This 50-kw induction furnace has a capacity of 250 lb.

The company also manufactured garment hangers of galvanized wire which were subjected to solvent (trichlorethylene) degreasing since they were shipped unpainted. In the course of the investigation it was determined that vapors of trichlorethylene from this degreasing operation were being carried into the "burn-off" furnace where they were thermally decomposed into gaseous products of sufficient corrosiveness to attack the uncoated garment hangers being processed at that point. The corrosive attack was responsible for rusting in the finished hangers within a short time after enameling.

EXPERIMENTAL FOUNDRY: Equipment for sand molding and casting various types of test specimens and commercial castings provides suitable facilities for investigation of cast metals under a variety of conditions.

In the report to the sponsor it was recommended that steps be taken to prevent the entry of trichlorethylene vapors into the "burn-off" oven. When this precaution was taken the difficulty from rusting was completely eliminated.

Although a project of this nature can hardly be classed as research, it nevertheless illustrates one of the many ways in which nonprofit industrial research institutions are able to serve smaller industries who cannot justify the cost of maintaining their own laboratory facilities and technical personnel.

Melting furnaces and sand molding equipment are available for melting and casting of up to 250 lb of ferrous or nonferrous metals. If desired, ingot molds are available for casting molten metal for forging or rolling. Melting furnaces are of the high-frequency induction variety in a wide range of sizes. A 20 kw induction unit is equipped with melting crucibles of 2, 10, 17, and 30-lb capacity while a larger 50-kw motor generator set is equipped with 100-lb and 250-lb melting furnaces. Either of these units

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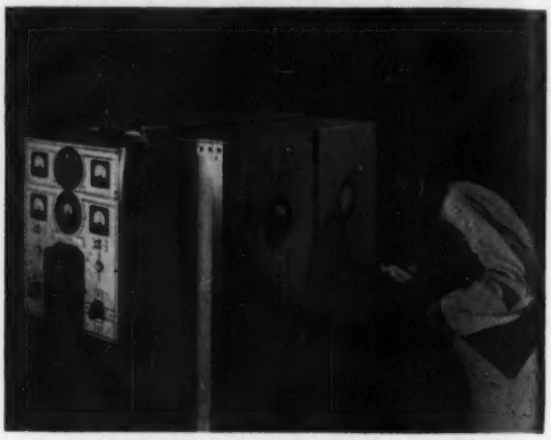
may be readily adapted to use for induction heating for hardening, brazing or hot working of metals.

Supplementing the melting and casting facilities commercial-scale equipment is available for forging and hot or cold rolling of metals. A Nazel-type 2B forging hammer capable of handling steel bars or ingots up to 3 x 3 in. cross-section, and a Schmitz rolling mill equipped with 10 in. diam by 20 in. face rolls and powered with a 75 hp reversing motor will handle a variety of hot and cold working operations. These items are supplemented by a gas-fired forging furnace with inside muffle dimensions of 9 x 11 x 18 in. This furnace, equipped with automatic temperature recording controls, is capable of temperatures up to 2400°F and may be used for heat treating and annealing in controlled atmospheres.

In order to provide adequate means of mechanical testing of various specimens, a complete line of testing equipment and shop facilities for the preparation of test specimens is maintained. Numerous precision machine tools for machining and fabrication of metals are provided in the Institute's machine shop. A modern toolroom lathe (16-in. swing, 10-ft bed), a 20-in. shaper, and a Cincinnati M-2 milling machine are key items in this shop. Supplementary facilities include commercial equipment for gas and arc-welding, sheet metal and woodworking.

Well-equipped microscopic and metallographic laboratories are also provided. Equipment in these laboratories includes a Bausch and Lomb research model metallograph capable of 2500 diameters magnification complete with direct, polarized, darkfield illumination, a Tukon microhardness tester for determining Knoop hardness numbers on microconstituents in metallographic specimens, and various smaller microscopes including a petrographic microscope for examination of slag, minerals, ceramics, and other nonmetallic specimens. A photographic darkroom for the preparation of photomicrographs as well as for copying, enlarging and other general photographic purposes is also provided.

TUKON MICROHARDNESS TESTER. Modern precision instruments in the hands of skilled technicians make possible accurate hardness measurements.



STANDARDIZED ACCELERATED WEATHERING MACHINE which subjects test panels to simulated outdoor weather conditions.

Equipment and competent personnel for experimental stress analysis including machine and structure design are available. Extensive use is made of brittle lacquer (Stresscoat) and photoelastic methods supplemented by the employment of electric strain gage equipment. Also available in this section is a wide variety of electronics equipment including recording oscillographs, cathode ray oscilloscopes, complete sound and vibration analysis apparatus, a stroboscopic tachometer, and numerous special instrumentation items designed and built for specific projects by the members of this section.

Radioactive Tracer Lab Available

The analytical section, which acts as a service group to other divisions of the Institute, consists of fully equipped laboratories for the chemical analysis of both ferrous and nonferrous metals and is staffed by a group of specialists in the field of chemical analysis. In addition to routine equipment for wet chemical analysis, modern spectrographic and X-ray diffraction apparatus are provided. If need be, research on new rapid and more accurate methods of chemical analysis may be conducted in connection with a given sponsor's work. Apparatus and qualified personnel for radioactive measurements are also available. The application of radioactive tracer techniques to the solution of industrial problems is an important function of this group.

The protectice finishes section of the Institute serves both as a service and research group. As production techniques of metallic products advance so also must the protective finishes field advance.

Machinability Research Program Reported

ONE of the most complete machinability research programs published in recent years has just come out in book form. The 162 page book is published by Curtiss-Wright Corp., Wood-Ridge, N. J.

The book starts with basic and complete analysis of machining conditions. The work covers tool design and selection, microstructures, evaluation of productivity of machine tools and every variable in the highly complex problem of better machining of standard steels, jet alloys and cast irons.

The work was sponsored by U. S. Air Force, resources planning section, industrial planning division of the Air Materiel Command, Industrial organizations which participated in the project are Ford Motor Co., Metcut Research Associates, Mass Institute of Technology and the Curtiss-Wright Corp.

In evaluating machining operations, the corresponding elements of all cutting tools are related to make the best use of basic theory. How tool angles control chip flow is clearly explained and diagramed. Examples of how corner angles or side-cutting-edge angles are as important as axial and radial rakes or back and side rakes in determining inclination and resultant rake are mathematically correlated, and summed up in Fig. 1.

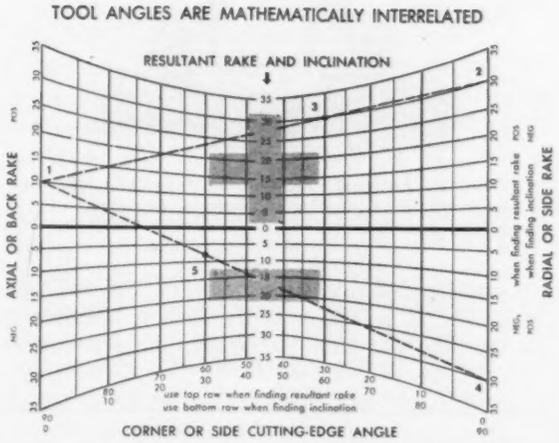

TOOL ANGLES ARE MATHEMATICALLY INTERRELATED
RESULTANT RAKE AND INCLINATION
AXIAL OR BACK RAKE
RADIAL OR SIDE RAKE
CORNER OR SIDE CUTTING-EDGE ANGLE
use top row when finding resultant rake
use bottom row when finding inclination

FIG. 1—Correlation of tool angles and resultant rake.

Thrust and Torque Are Separated

Dynamometers to measure cutting forces were widely used. Fig. 2 is a schematic drawing of a drill dynamometer which shows how thrust and torque were isolated so that they could be studied separately. Cutting-edge temperatures were carefully measured by thermocouples and calibration tables are presented. Surface roughness in microinches "Proficorder" graphs of surface are explained and evaluated.

Microstructures of all common metals plus jet alloy and nodular-graphitic cast iron are explained and cataloged. Power tests and machine tool evaluation tests to produce increased production are extensively covered.

The Ford Motor Co. and Jones & Lamson Machine Co. together developed a special automatic lathe for the job. The Ford hypoid pinion had been turned on conventional prewar design lathes equipped with high-speed steel tools, which, in terms of postwar machining and machine tools, were underpowered, obsolete, and no longer economical to operate.

Before acceptance and installation into production, this lathe was comprehensively tested on the builder's floor using various tools, feeds and speeds, and forgings of different compositions, heat treatments and microstructures. Actual test-

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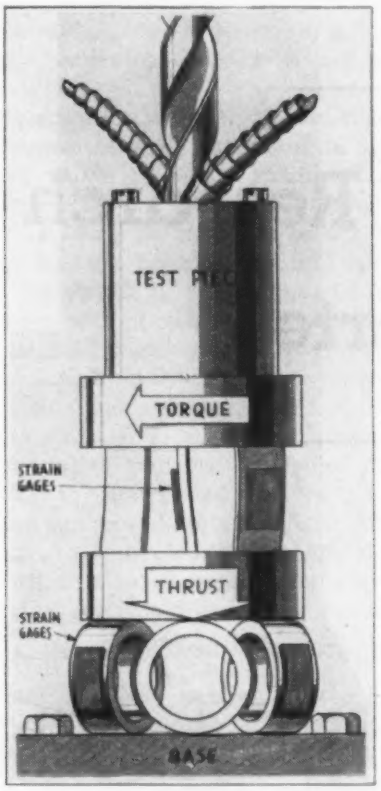

FIG. 2—Schematic drawing of the drill dynamometer which permits separate measurement of torque and thrust.

ing was divided into three phases: The machine itself, Fig. 3, selection of the best tool material for tool life and finish accuracy, and economical selection and control of the most machinable microstructure.

Production expectations were fulfilled; the machine, on the whole, was satisfactory. (One lathe now does the work of five machines it has replaced, at great savings in floor space, total power, material handling, and all fixed costs.) Because of the high speeds and spindle power (1005 rpm and 50 hp) machine evaluation tests were made to uncover possible sources of future trouble. For optimum surface finish, tool life and general machine service life, the maximum rigidity and freedom from vibration must be maintained.

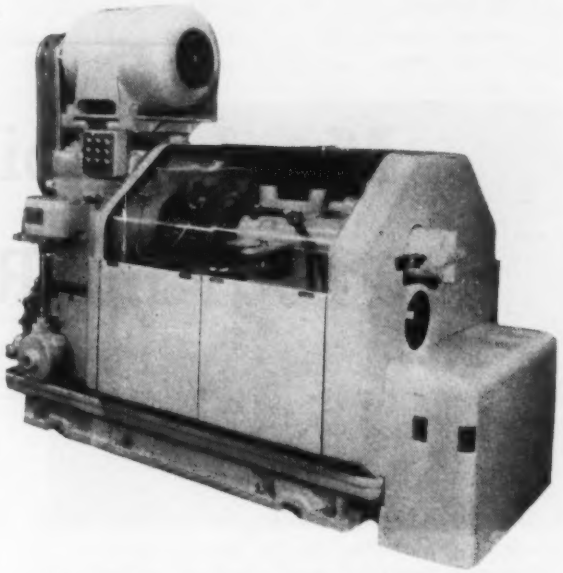

FIG. 3—The automatic lathe built by Jones & Lamson Machine Co. in collaboration with Ford Motor Co.

TABLE I

JET ALLOYS — PHYSICAL AND MACHINING PROPERTIES

	Brinell Hardness	Mayer Exponent	Coefficient of Friction, Average	Cutting Speed	Unit Power hp/cu in./min.	Shear Strength in Cutting, psi × 100	Ultimate Tensile Strength psi × 100		
							70 °F	1100 °F	1500 °F
S-816									
Annealed, 1950 °F	297	2.23	0.63	100	1.21	132			
Solution treated, 2250 °F	230	2.28	0.65	100	1.16	130			
Solution treated, 2150 °F	269	2.31	0.62	100	1.22	138			
Solution treated; aged, 2150, 1400 °F	268	2.34	0.69	100	1.20	135	160	122	78
INCONEL "X"									
Solution treated, 2100 °F	279	2.37	0.68	100	1.30	135			
S. T. and aged, 2100, 1550, 1300 °F	313	2.25	0.66	100	1.26	145	162	140	50
Equalized, 1625 °F	265	2.21	0.72	100	1.27	135			
Equalized; aged, 1625, 1300 °F	332	2.37	0.68	100	1.38	147			
TIMKEN 16-25-6									
Work hardened	319	2.09	0.61	200	1.18	130	148	95	45
Stress relieved, 1300 °F	271	2.24	0.60	200	1.02	127			
Solution treated, 2150 °F	187	2.17	0.62	200	1.05	115	109	85	43
AISI 347									
Annealed	262	2.08	0.60	200	0.87	109	90	61.5	24
AISI 4340									
300 Brinell	300	2.20	0.68	200	0.94	111	150		
AISI 410									
200 Brinell	204	2.22	0.69	200	0.82	97	89	44.5	9
300 Brinell	305	2.11	0.65	200	0.92	109			
SAE 8640									
300 Brinell	302	2.15	0.67	200	0.93	109	150		

TABLE II

FLAKE V. NODULAR CAST IRON

Comparative Compositions, Physical Properties and Tool Life of Flake-Graphite and Nodular-Graphite Cast Irons

Material	Chemical Composition									Physical Properties					
	Carbon	Manganese	Phosphorus	Sulphur	Silicon	Nickel	Magnesium	Molybdenum	Chromium	Brinell Hardness	Ultimate Tensile Strength, psi	Yield Point, psi	Pct Elongation, 2 in.	Pct Area Reduction	Cutting Speed, fpm for 200 cu in. Tool Life
Nodular Graphite Irons:															
2% as cast	3.33	.45	.11	.018	2.66	1.65	.079			265	97,250	79,000	2.0	1.5	200
4% as cast	3.41	.42	.09	.014	2.82	.81	.073			215	93,000	72,000	4.0	3.5	310
17% as cast	3.82	.23	.082	.018	3.04	1.13	.082			207	84,700	69,800	17.5	16.5	420
20% annealed	2.79	.53	.09	.014	2.76	1.59	.071			183	77,000	62,000	20.0	21.0	600
22% annealed	3.69	.27	.045	.014	2.64	1.15	.060			170	70,000	56,000	22.0	22.0	970
Flake Graphite Irons:															
Acicular iron	2.78	1.03	.12	.064	2.30	2.11		.32		263	59,000				150
Fine pearlite	3.22	.62	.08	.097	2.10	.85			.64	225	45,000				310
Coarse pearlite	3.17	1.10	.10	.103	2.44					195	35,000				325
Ferrite (annealed)	3.47	.35	.05	.133	1.62					100	15,700				960

Cycle time (floor to floor) is about two and a half times the actual machining time (21 sec against 8 sec), but further reduction of unloading and reloading time was considered impractic-

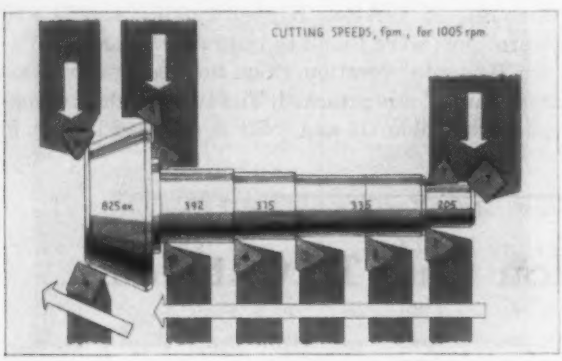

FIG. 4—Ten tools operating on two slides simultaneously turn, face and chamfer all surfaces.

able, especially on a single-spindle machine. Chucking and dogging in the usual sense have already been eliminated. The previously center-drilled new piece is laid on a cradle as the finished piece is removed. The hydraulic tailstock presses the piece into five knife edges on the face-plate (somewhat like a wood-lathe live center) after the cradle retracts. The headstock center is spring-loaded for location of the piece prior to imbedding the drivers. Tailstock pressure automatically drops after imbedding to a safe holding pressure. The coolant hood is automatically retracted and reclosed during the loading operation.

Two slides with simultaneous independent feeds were provided to perform all turning facing and chamfering operations at one time, Fig. 4. Six tools operate on the front slide; four on the rear. The thread diameter, which requires the most metal removal, is cut by two tools to equalize tool wear, minimize time and provide better finish. The other diameters, turned by one tool each, are approximately equal to equalize cutting times.

Tool life, dimensional accuracy, and quality of finish require simultaneous consideration. The tool-life end point depends not only on economical regrinding, but also on how much wear is tolerable before dimension limits are exceeded.

Various grades of carbide were tried, and Kennamental K3H or its equivalent proved far superior to the others, the report states. This doesn't preclude possibility of a still better material. Optimum feed was slightly under 0.015 in. per rev. Higher feed rates overloaded the machine and caused tapering due to deflection of the piece, in addition to excessive tool wear.

Tool No. 6 which turns the gear face and operates at an average speed of 825 fpm, shows 0.030 in. wear at 350 pieces. The others, at the same time, all show under 0.010 in. wear, and their speeds are all less than 400 fpm.

At optimum feed, with best tools and controlled part microstructure, total average power demand was 18 hp. While cutting loads momentarily exceed 50 hp (the motor rating), they are well under the stalling torque and the motor size is adequate.

Tool life and production rates in machining

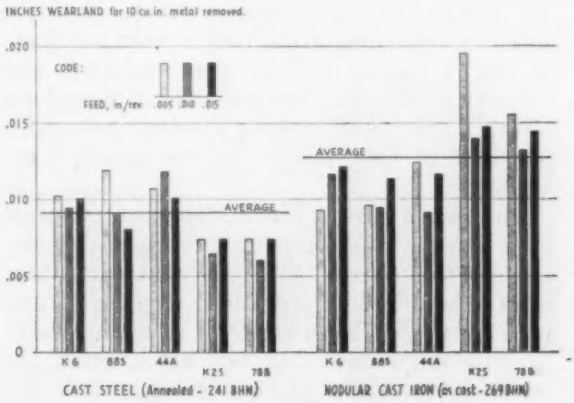

FIG. 5—Graphic comparison of the machinability of cast steel v. nodular cast iron.

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Continued

TABLE III

CAST STEEL V. NODULAR IRON

	Cast Steel, Annealed[1]	Nodular Cast Iron		
		As Cast	Annealed* 600 °F	Annealed* 1320 °F
Brinell Hardness	269	255	269	237
Ultimate Tensile Strength, psi	85,750	72,000	82,500	74,650
Yield Point, psi			68,500	67,750
% Elongation			1.0	
% Area Reduction			1.0	
Young's Modulus of Elasticity, 10^6 psi	27.6	23.9	23.8	24.4
Carbon	1.37		3.38	
Manganese	.69		.64	
Phosphorus	.037		.19	
Sulphur	.037		.008	
Silicon	.71		2.40	
Nickel	.07		.060	
Chromium	.04		.06	
Molybdenum	.12			
Copper	1.66		.26	

[1] Cast steel, annealed at 1750 °F 1½ hr., air cooled, reheated to 1450 °F 1 hr., furnace cooled to 1100 °F 2½ hr., air cooled.

* Tensile strength of the 600 °F annealed nodular cast irons is approximately equal to that of annealed cast steel; Brinell hardnesses are identical, but the nodular iron casts easier.

high temperature jet alloys were fully investigated. The mechanical, physical and machining characteristics of these alloys appear in Table I. Cutting tests using a variety of carbide tools were conducted on the jet alloys. The alloys were tested in the different conditions shown in the table.

Possibly the most exhaustive tests yet done on cast iron are reported at length. Flake and nodular-graphitic irons are compared. Table II is a summary of some of the results of these tests.

The weakest nodular-graphite iron is much stronger than the strongest flake-graphite iron (UTS: 70,000 against 59,000 psi) but the nodular iron permits 970 fpm cutting speed while the acicular iron permits only 150 fpm for the same tool life and tool wear. The 20 pct annealed and the 22 pct annealed are nominally the same compositions as the 2 pct as-cast and the 17 pct as-cast nodular irons, respectively. These compositions and properties were taken from the actual test bars. Annealing cycle for all annealed irons: 1650°F for 30 min, furnace cooled to 1275°F and held 5 hr, air-cooled. Tensile strength was obtained from 1.2 in. arbitration bars for the flake-graphite irons; keel blocks for nodulars.

Power decreases as feed is increased with all cast irons. In general the cutting power was found to be proportional to hardness. Surface finish depends on microstructures which are profusely illustrated. The effect of tool sharpness and cutting speed on finish was also studied. Annealed cast irons have poorer finish because of increased amounts of ferrite. Higher cutting speeds and worn tools were found to improve the surface finish. The vital question, "Can nodular iron replace cast steel?" was attacked. The two metals are compared in Table III and wear is graphed in Fig. 5.

Duplicator Parts Precision Cast To Cut Costs

IN analyzing the production of the Ditto D-44 Direct Process Duplicator, it was found that two small parts used on the rotating drum were excessively difficult and costly to make.

Originally, the drum lock pawl was assembled from a forging and a machined pin. It was necessary to perform four milling operations on the forgings in order to obtain the required accuracy. Special form cutters, jigs, fixtures and gages were needed in order to fabricate and assemble the pawl. The operations performed included grinding two sides of the forgings for thickness milling a notch; drilling, countersinking, and reaming a hole; four separate milling operations, spotting and countersinking a second hole, drilling a third hole, machining the pin, and assembly.

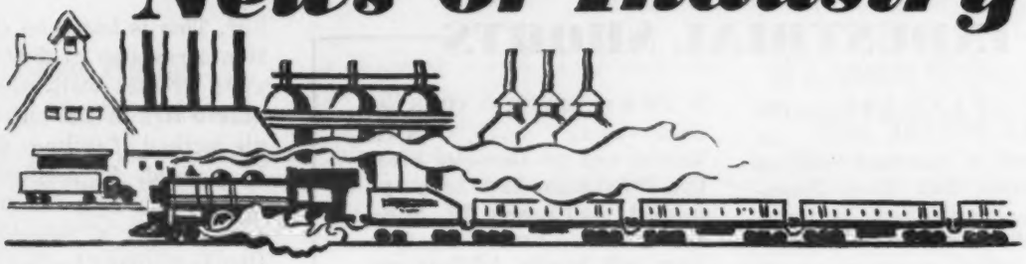
The second part, a clutch stop pawl, consisted of a four-piece assembly of a forging, a stamping and two rivets. As on the first part, there were several milling operations required to prepare the forging for assembly. It was necessary to drill and countersink two holes, grind the thickness to obtain size and flatness, drill and ream one hole, and then assemble the stamping and forging with the rivets.

DRUM LOCK pawl, top, and clutch stop pawl in the as-cast condition.

To reduce costs and eliminate as many operations as possible, the two parts were ordered as precision investment castings. As furnished by Austenal Laboratories, each part was a single casting requiring only the reaming of one hole to complete the part for use.

Precision casting gave more accurate parts, which lasted longer in service. The cost of machining was drastically reduced, and the cost of assembly was eliminated. As originally produced, the clutch stop pawl cost 143 pct more and the drum lock pawl 442 pct more than these two parts cost now.

News of Industry



Fast Tax Write-Offs

Washington—Frank R. Creedon, former housing expediter, was named this week to pass on applications received by NPA for fast tax write-offs.

Mr. Creedon heads a "Facilities Clearance Staff" in NPA which has been assigned the task of processing the certificates of necessity submitted by business firms seeking accelerated depreciation for tax purposes.

Applications for the 5-year tax write-offs must first be submitted to the National Security Resources Board. NSRB then forwards the applications to the agency of government involved, such as NPA or the Defense Dept. for recommendations. Final approval or disapproval rests with NSRB.

J&L Considers 2 for 1 Stock Split

Pittsburgh — Stockholders of Jones & Laughlin Steel Corp. will be invited to a special meeting soon to consider a 2-for-1 split of the common stock and a plan for granting stock options to key employees at the market price when options are granted.

Installing Cold Mill

Pittsburgh — American Cladmetals Co. is installing a 30-in. cold reduction mill at its Carnegie plant. The mill was formerly in operation at the Otis Works of Jones & Laughlin Steel Corp., Cleveland.

Rebuild Jap Soaking Pits

Pittsburgh—Sixty soaking pits in a Japanese steel mill will be rebuilt by Furnace Engineers, Inc., this city.

Republic-Armco Push Taconite Program

Will revamp old Mesabi Iron Co. plant at Babbitt, Minn. . . . Schedule operation for late 1952 . . . 300,000 tons of concentrate annually seen—*By Bill Lloyd.*

Cleveland—The magnetic taconite beneficiation program gained new momentum this week as plans of Reserve Mining Co., jointly owned by Republic Steel Corp. and Armco Steel Corp., to revamp the old Mesabi Iron Co. plant at Babbitt, Minn., for production of 300,000 tons of concentrate a year, came to light here.

To Cost $5 Million

Final details of the project will be decided at a meeting of company officials later this month.

Cost of revamping the Babbitt plant, which was built about 1920, will be at least $5 million, according to conservative estimates. Work is expected to start next spring and it is believed that about 18 months will be required to install new machinery and get the plant into operation. A work force of 350 men will be required.

Purpose of the move is to get the facts on the beneficiation of magnetic taconite on a commercial basis. New flow sheets are being developed, indicating new operating economies. One of these involves starting the removal of tailings at the earliest possible stage. The more silica grains that can be removed in the early stages of the process the less grinding and electric power is required, resulting in lower costs.

New machinery to be installed at the Babbitt plant will include conveyers, primary and secondary crushers, rod and ball mills, magnetic separators, classifiers, thickeners, filters, agglomerating equipment, and sintering or pelletizing equipment—an entirely new plant. Babbitt is close to a power line.

While the Babbitt plant will be a pilot operation yielding a possible maximum of 1000 tons of finished product a day, on a 300-day annual operation, it is possible the plant may be enlarged at a later date. Crushing equipment will overbalance agglomerating capacity at the start.

25,000 KW Power Plant

The Beaver Bay project on the lake will be built as planned, including a 25,000 kw power plant. Construction of this project could start about the time the revamping of the Babbitt plant is completed, or some time in 1952.

It is understood the decision to go ahead with Beaver Bay must be made before the end of 1952, as the water permit which was granted Reserve Mining Co. for use of water and disposal of tailings expires late in 1952 and renewal might be difficult for political reasons.

Disclosure of plans for production at Babbitt, however, have revived an old controversy, over the ultimate location of the Beaver Bay plant. Some observers close to the range believe the Beaver Bay project should be put at Bab-

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INDUSTRIAL SHORTS

NEW STANDARD — The METAL POWDER ASSN. has released a standard entitled "Preferred Iron Core Dimensional Specifications." It defines the terms commonly associated with electronic cores made from iron powder and also specifies the preferred dimensions of standard insert iron cores and threaded iron cores.

BUILDING 2 PLANTS — NATIONAL LEAD CO. has contracted for two new sulfuric acid plants. One will be located in St. Louis and the other in Sayreville, N. J., and both will have capacities in excess of 300 tons per day.

FORMS PARTNERSHIP—Formation of a partnership under the name of H. F. BLACK EQUIPMENT CO., Cleveland, has been made by H. F. Black, president, and J. W. Coulton. They will sell, exclusively, Elwell-Parker power industrial trucks and allied materials handling equipment in northeastern Ohio.

BUYS PLANT—The Amsterdam, Detroit, plant of the Chicago Pneumatic Tool Co. has been purchased by GENERAL MOTORS CORP. The tool company's Detroit operations will be transferred to Utica, N. Y.

HEADS GROUP—Stanley Claster, West Coast district manager, Luria Bros. & Co., Inc., San Francisco, has been elected president of the Northern California Chapter of the INSTITUTE OF SCRAP, IRON & STEEL.

CENTENNIAL — An international convocation, organized under CENTENNIAL OF ENGINEERING, 1952, INC., will celebrate 100 years of engineering as an organized profession in the United States, from Sept. 3 to 13, 1952, in Chicago. An exposition will be held at the Chicago Museum of Science and Industry during the months of July, August and September, 1952.

NAMES DISTRIBUTORS — Behler-Young Co., Grand Rapids, and the Demmler Bros. Co., Pittsburgh, have been appointed distributors by SERVEL, INC., Evansville, Ind. They will handle All-Year air conditioners for homes and business establishments.

EXPANDS FACILITIES — Work has begun on a $390,000 program to expand facilities for production of tungsten and molybdenum at the FANSTEEL METALLURGICAL CORP., North Chicago, Ill. Much of the new equipment will be housed in the Fansteel-Tantalum Defense plant. A warehouse is also being built.

AISC OFFICERS—R. D. Wood, Mississippi Valley Structural Steel Co., Chicago, has been elected president of the AMERICAN INSTITUTE OF STEEL CONSTRUCTION. J. E. Jackson was named first vice-president; J. Philip Murphy, second vice-president; L. Abbett Post, executive vice-president; James M. Straub, treasurer; and M. Harvey Smedley, secretary.

AFFILIATE—Stanley B. Amidon and Fred S. Gates have become affiliated with MICHAEL SCHIAVONE & SONS, INC., New Haven, Conn., as the Stanley B. Amidon Div. They will continue to operate as iron and steel scrap brokers with offices in Worcester.

EASTERN AGENT—The General Electric Co., Pittsfield, Pa., has appointed the STULTZ ELECTRIC WORKS, Westbrook, Maine, distributor of their insulating materials.

EXPRESS SERVICE — A new fast water express service to operate on the Mississippi River and the Illinois Waterway between Chicago, St. Louis and New Orleans is being planned. Twelve house type barges are being built in a St. Louis shipyard, each to have a capacity of 1400 tons of cargo.

bitt. This is based on the assumption a revision of flow sheets will yield greater utilization of available water at Babbitt and a simple method of tailings disposal can be devised. By producing the finished product at Babbitt, Reserve could effect a two-thirds reduction in tonnage hauled to the lake.

Projects Cost $220 Million

However, it is understood the Babbitt project will not delay the program at the lake, which will ultimately be a four unit plant capable of producing 10 million annual tons of concentrate. Cost of the first unit will be $60 million and final cost of the 10 million ton project will be about $160 million.

Reserve's project is one of three now under way to utilize marginal ores and magnetic taconites. Erie Mining Co., managed by Pickands, Mather & Co., Cleveland, has a 200,000-ton pilot plant in operation at Aurora, Minn., which has produced some experimental tonnage. Some of this has been shipped to Youngstown Sheet & Tube Co. at Youngstown, for sweetening lean ores.

Oliver Iron Mining Co., U. S. Steel Corp. subsidiary, is completing a half million ton plant at Virginia, Minn., which is expected to be in operation in time for the 1951 shipping season.

Westinghouse Reports Record Net

Pittsburgh—Westinghouse Electric Corp. has reported highest third quarter earnings in the company's history, $21,872,493. This compares with $20,554,447 for the third quarter in 1949. Earnings for 9 months in 1950 totaled $49,079,200 compared with $48,964,408 for the same period in 1949.

Stokes Builds Plant Addition

Philadelphia—A new factory addition to cost $700,000 is being built by F. J. Stokes Co., makers of industrial machinery here. To be completed in early 1951, the addition will add one-third more space to the present plant.

Canadian Defense Program Hampered by Shortage of Steel

Mills produce at record . . . But declining U. S. shipments take toll.

Ottawa—Canada's defense program is being hampered by the steel shortage. Its steel plants are producing at the highest rate in history — 3,250,000 tons of steel this year. But the supply situation is grim and grimmer still for Canada's $70 million defense shipbuilding program. Ships need sheet steel—in greatest shortage. (THE IRON AGE, Nov. 2, 1950, p. 112.)

A Canadian official said that under "the equality of sacrifice" principle to guide Canadian-U. S. defense production planning, international priority ratings will apply equally to defense equipment producers in both countries. Trade officials here worked out a scale of defense order ratings which were sent to Washington.

Meanwhile, Canadian producers are voluntarily rationing steel for civilian use. Canada has traditionally been a steel importer from the U. S. but this avenue has been blocked by tightness of steel in the U. S. The Steel Co. of Canada has had its ear close to the ground and has invested nearly $40 million in the past few years to expand mills for flat-rolled production. Without the Steel Co.'s expanded tonnage of over 500,000 tons a year Canadian fabricators would have thrown up their hands. Other improvements bring the Steel Co.'s postwar investment to about $65 million.

Subcontractor Plan for Defense

Albany, N. Y.—A bits and pieces strategy of sifting down defense orders to the grassroots level of small subcontractors and skirt production bottlenecks was offered by Charles A. Simmons, Sr., president of the Simmons Machine Tool Corp., here. He is a former War Production Board official in World War II.

He said the plan cuts down red tape and gives "the small guy" a share of government contracts. It will also help in three problems of military production: machine capacity, labor availability, and manufacturing flexibility.

Thousands of machine tools in small plants and universities may be idle during a crisis because their owners cannot seek out contracts, he said. The big firm would handle negotiations for the job and the government would be left out of the subcontract picture, Mr. Simmons stated.

Bethlehem to Prepare Plans For New 12,500-Ton Cargo Ship

New York—Preparation of detailed specifications and contract plans for a new 12,500 ton defense-type cargo vessel designed to replace the Liberties and Victories of World War II has been assigned to Bethlehem Steel Co's shipbuilding division, according to the Maritime Administration.

Bethlehem received the award at a negotiated price of $1,219,000. Two lower bids, one from W. C. Nickum & Sons and another from the Newport News Shipbuilding and Dry Dock Co., were rejected. Contract plans are called for in 30 days and detailed specifications in 250 days.

NPA Amends DO Order to Give Priority Power to Any Department

Washington—Under an amendment to its DO priority regulation, the National Production Authority has cleared the way for use of ratings by any government department which may have a program "intimately connected with defense."

Previously, only the Defense Dept. and Atomic Energy Commission could assign ratings. Under the revised regulation, the Defense Dept. is permitted to delegate rating authority to other departments for specific programs.

The amendment also authorizes ratings for the purpose of helping prime and subcontractors obtain production equipment which may be needed to produce defense orders.

NACA Makes Market Cost Study

New York—A nationwide cost study for determining market policies is being made by the National Assn. of Cost Accountants. The report, to be released next year, will aid management in measuring performance of market functions.

SCAFFOLD ON WHEELS: The Denver Municipal Auditorium was built with a new type of scaffold that rolled over angle iron track on Bassick 10-in. heavy duty Grooved Wheel Casters. Since the scaffold moved with the job, contractors Swinerton & Walberg did not build the usual complete scaffold for the entire structure.

Sees Need of 30 Million Ton Quick Capacity

Kaiser says it could be built in 2 or 3 years even if it means putting controls on economy . . . Calls for increase in aluminum capacity . . . Pays off RFC loan.—*By Bill Packard.*

New York—The U. S. needs 30 million tons more steel capacity as soon as it can be built, Henry J. Kaiser told newsmen here last week. He said that the additional capacity is needed both for defense and civilian use, and that it should be built even if it means placing temporary controls on the economy. He estimated that it could be built in 2 or 3 years.

Aluminum Boost Needed

He also called for a substantial increase in aluminum capacity, stating that the nation should be willing to do whatever is necessary to get the job done.

Occasion for Mr. Kaiser's remarks was a press conference marking successful conclusion of a $125 million financing program for Kaiser Steel Corp. Thousands of investors throughout the nation will now become new stockholders of the corporation.

Proceeds from the financing are being used to retire the balance ($91,185,990) of all RFC loans to the corporation, finance a new $24.5 million expansion program, and provide additional working capital for the corporation's expanded production facilities.

This is one of the largest financings through private money in the steel industry during the past 20 years. It also comes at a time when many companies are finding it difficult to raise expansion capital through private sources. Mr. Kaiser called it "a momentous demonstration of American private enterprise and private financing".

It was obviously with great satisfaction that Mr. Kaiser paid the government off in full. (It can be recalled that he had repeatedly tried to get his indebtedness reduced.) He pointed out that the government received $1.23 for each dollar loaned to him to build and operate his steel plant at Fontana, Calif.

The $24.5 million expansion program consists chiefly of two parts: (1) A tinplate mill at Fontana with capacity of 200,000 tons per year, and (2) an increase of 180,000 tons per year in basic steelmaking capacity.

The seven western states last year consumed 700,000 tons of tinplate. But the only tinplate mill west of the Mississippi River is that of Columbia Steel, a U. S. Steel subsidiary, at Pittsburg, Calif. This mill is rated at a little more than 300,000 tons per year.

Install Another Openhearth

To expand basic steelmaking capacity, an eighth 200-ton openhearth furnace will be installed. Also to be added are additional soaking pits and blooming facilities. Together these will increase the plant's capacity by 15 pct, raising total capacity to 1,380,000 tons. These facilities are expected to be completed by the end of 1952.

When asked if he contemplated any additional expansion beyond that announced, Mr. Kaiser characteristically replied, "There has never been a time in my life that I wasn't contemplating further expansion".

Kaiser's Record at Fontana

New York—The Fontana plant was built in 1942 and was originally equipped only to roll plates, structural shapes and shell billets. Although it has always been a private undertaking, financing was obtained through RFC loans.

All earnings of the corporation to date have been plowed back into paying off principal and interest on RFC loans and expanding production facilities.

Expansions since 1942 have added facilities for rolling merchant mill products, skelp, hot-rolled strip and sheet, cold-rolled strip and sheet, continuous weld small diameter pipe, electric weld line pipe, and large diameter expanded pipe.

Ingot production has more than doubled — from 450,000 tons in 1943 to an estimated 1,200,000 tons in 1950. This was done by adding a seventh openhearth furnace, a second blast furnace which doubled West Coast pig iron capacity, and a new battery of 45 by-product coke ovens, making 135 in all.

The corporation also built its own 52-mile railroad to open its own Eagle mountain iron ore mine, making possible one of the shortest iron ore hauls in the industry. It also bought coal mines in Utah with an estimated 100 million tons of recoverable high volatile coking coal.

U.S.-Canada Reach Agreement

Washington—A working agreement to continue efforts for common defense has been reached by the U. S. and Canada. The wartime Hyde Park agreement and the joint Mobilization Planning Committee will be continued. The two nations will work to remove trade barriers, consult on economic controls, and develop a coordinated production program.

Louis L. Weber Named to Post

Chicago—Louis L. Weber, vice-president of Choremaster Div. of Lodge & Shipley Co., was named vice-chairman of the garden tractor section of the Farm Equipment Institute at a recent meeting here.

Cladmetals Co. to Install Mill

Carnegie, Pa.—A 30-in. wide cold reduction mill stand with auxiliary equipment will be installed by American Cladmetals Co. in its Carnegie plant by 1951. The installation is another step

in Cladmetals' aim of integrating all its operations here. The mill was purchased from the Jones & Laughlin Steel Co., which used it at its Otis works in Cleveland.

It will now be used to process products going into cooking utensils but will be suitable for production of cladmetal for ammunition components and silver cladmetal bearings. Cladmetal uses the Kinney process for bonding together almost any two metals.

Labrador Road Contracts Let To Cartier by Quebec Rail Co.

Montreal — Contracts to build the railway from Seven Islands, Quebec, to the Labrador iron ore deposits have been officially let by the Quebec North Shore & Railway Co. to the Cartier Construction Co., Ltd., contracting group. (THE IRON AGE, Oct. 5, 1950, p. 110.)

Equipment is now being moved in to start pre-winter construction of the 360-mile road. It is to be preliminary work to proceed through winter so that the major project can start without delay in the spring. The railway is expected to be ready in 1954 and to ship ore in 1955 at the rate of 10 million tons annually. (THE IRON AGE, Oct. 19, 1950, p. 93.)

Premiums to Fatten Paychecks

Pittsburgh — Christmas season pay checks of 14,000 Weirton Steel Co. employees will be fattened by $63,000 due to a waiver of insurance premiums for December by the Employees Relief and Beneficial Association. The waiver will be the second during the year. The ERBA previously had waived the January 1950 premiums when the new insurance plan began.

Timken Moves Rock Bit Dept.

Canton, Ohio—Timken Roller Bearing Co. moved its carbide insert rock bit department to Mount Vernon, Ohio, Nov. 1, officials announced. Transfer of equipment required about a week.

Rising Costs, Wages Overshadow Steel Future

Steelmakers report record production, earnings for first 9 months . . . Warn higher prices will follow wage increases . . . 1952 capacity may exceed 110 million tons.

New York—Sharply rising material costs and the knotty problem of large steel wage demands, cast dark shadows over the future, but steelmaking operations for the first 9 months of this year were highly satisfactory. Higher capacity and sustained near-capacity output are reflected in record earnings by the nation's steel companies for the first three quarters.

These records earnings are possible only because of a new alltime high in sales. In the past, earnings as a percent of sales have been more than four times what they are so far this year, largely because taxes were lower then.

Records Established

Third quarter production and sales are only a shade less than they were during the second quarter when alltime records were established. However, third quarter earnings of the nation's eight top steel producers (rated on capacity) are 7.3 pct less than second quarter earnings. This is true partly because most steel firms chose to assign the new, higher corporate income taxes against third quarter earnings instead of revising first and second quarter reports. But rising material costs played a part, too.

Third quarter '50 earnings of the top eight companies are 58 pct greater than third quarter '49 when steel sales slumped. Earnings of these companies for the first 9 months of this year are 27 pct greater than they were during the similar period of 1949. See the accompanying table for comparative earnings by companies.

Some stockholders are also slated to receive record payments. U. S. Steel declared dividends totaling $1.50 per share on common stock. Bethlehem Steel decided to pay $2.00 a share on its common

Steel Company Earnings

Company	Third Quarter '50	Third Quarter '50	Nine Months '50	Nine Months '49
U. S. Steel	$59,742,302	$39,599,132	$178,821,540	$133,223,409
Bethlehem Steel	33,563,841	23,019,799	90,804,414	82,898,402
Republic Steel	18,682,542	9,870,703	56,384.618	35,347,875
Jones & Laughlin	11,233,078	4,870,019	26,481,048	20,038,918
National Steel	14,042,525	10,047,905	34,091,331	35,916,812
Youngstown S & T	10,945,138	7,514,626	29,221,911	28,557,991
Armco Steel	12,037,343	6,584,411	37,743,114	22,693,044
Inland Steel	12,082,908	7,555,103	32,085,262	23,842,637
Sharon Steel Corp.	2,706,647	120,519	7,299,884	3,543,312
Wheeling Steel	5,832,322	2,139,664	13,668,467	8,278,233
Colorado Fuel & Iron	2,545,611	1,414,832	.....	.....
Crucible Steel	1,991,555	.....	4,055,631	.....
Allegheny Ludlum	2,873,998	—183,341	7,445,169	1,376,660
Granite City Steel Co.	1,563,964	628,047	4,437,516	2,223,514
Copperweld Steel Co.	284,021	204,258	927,488	1,425,737
Alan Wood Steel Co.	628,081	62,920	1,628,540	1,835,172
Midvale Steel	—47,520	—1,221,315	—274,086	—944,732
Barium Steel Corp.	511,775	—12,681	599,774	1,107,927
Continental Steel Corp.	758,722	205,449	2,469,512	*619,254
Rotary Electric Steel	558,017	—115,498	1,353,410	1,206,254
Thomas Steel	.....	203,370	.....	929,945

—Deficit
* After Inventory Adjustment

UNIVERSITY OF MICHIGAN LIBRARIES

stock. Both are record payments. U. S. Steel's third quarter earnings ($59,742,302) amounted to $2.04 a share on common stock; its 9-month earnings ($178,821,540) equaled $6.12 a share. Bethlehem's third quarter earnings ($33,563,841) equaled $3.33 a common share, while 9-month earnings ($90,804,414) amounted to $8.96 a share.

Steel leaders are worried about rising costs. Irving S. Olds, chairman of U. S. Steel, called attention to recent price increases on copper, heavy fuel oil, scrap, nickel, palm oil, zinc, tin, refractories, and lubricants. He said that increases in these and other commodities since June 1 had already raised steelmaking costs $3.50 a ton. He declared that these cost increases would total $70 million a year for U. S. Steel alone.

But right now wage costs are causing steel people to lose more sleep than all other costs combined. They are generally agreed that a wage increase at this time would be economically unsound. But they are realists, too. As one executive put it, "How do you get away from it now?" He had just finished listing other industries which had already granted fifth-round wage boosts. More than one steel executive admitted that other wage increases might make it necessary to raise steel wages to prevent a strike or loss of workers.

All steel leaders who commented on wages and prices declared with certainty that any steel wage increase would make a steel price increase inevitable.

Steel expansion may proceed at a faster rate than scheduled. Although the present expansion timetable calls for 110 million ingot tons total steel capacity by the end of 1952, other programs not now authorized or planned are expected to increase this total.

Demand was described as "terrific." It was admitted that as the defense and essential civilian programs grow more and more steel will have to be channeled to them. This can only mean less steel for regular peacetime use.

CF&I Plans Steel, Pig Iron Boosts in $26 Million Program

Will add two openhearths, rebuild blast furnace, add rolling mill.

New York—A $26,200,000 expansion-improvement project that runs the gamut from a new coal mine, added steelmaking and pig iron capacity, to a new rolling mill was announced by the Colorado Fuel and Iron Corp. through spokesman Charles Allen, Jr., chairman of the board of directors, at the annual stockholders meeting here last week.

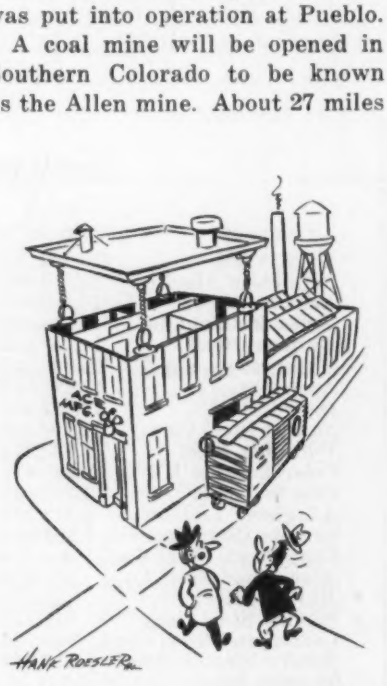
The project includes two new 225-ton openhearth furnaces and rebuilding of "A" blast furnaces at the Pueblo steel plant. Steelmaking capacity will grow to 1,645,000 tons—a gain of 325,000 tons. Pig iron capacity will total 895,000 tons, a jump of 45,000 tons. Completion by 1952 is expected.

New 10-In. Rolling Mill

Pueblo will also get a new high-speed 10-in. rolling mill on the site of the replaced old rod mill. It will provide a wide range of rounds, flats, squares, rebars, angles, and other products. At the end of 1949, a high-speed rod mill was put into operation at Pueblo.

A coal mine will be opened in Southern Colorado to be known as the Allen mine. About 27 miles west of Trinidad, near the firm's Frederick mine, the new shaft will feed the heightened demand of the Pueblo mill for coking coal.

With the increased capacity of the Buffalo plant, now totaling 220,000 tons, and the expanded productivity of Pueblo, the company is expected to have a capacity of 1,865,000 tons annually.



"The boss warned he would raise the roof if we didn't get top production."

U.S. Steel Elects Mole V-P

New York—Harry E. Mole has been elected vice-president in charge of investments of U. S. Steel and Carnegie Pension Fund. Mr. Mole was formerly with the Bank of New York and Fifth Ave. Bank as assistant vice-president in charge of investment research. He is a graduate of Princeton, 1929, and Harvard Graduate School of Business Administration, 1931.

NPA Expected to Issue Order For a 25 Pct Aluminum Cutback

Washington—The National Production Authority was expected this week to issue an order effecting an across-the-board 25 pct cutback in the use of aluminum for non-defense goods.

This is a modification of the originally planned order which would have banned the manufacture of over 300 items. The order will limit shipments of aluminum for civilian uses to 75 pct of average monthly shipments and allow manufacturers to decide on reductions.

Base period to be used in figuring cutbacks is the last fiscal year, July 1, 1949 through June 30, 1950. Because the base period includes the low shipment period of the last half 1949, industry has protested that the 25 pct cut may actually result in a civilian reduction nearer 35 to 40 pct.

GM Sells $2 Billion in Products

Detroit—Sales of GM products to customers during the third quarter of 1950 reached nearly $2 billion, according to the company's

financial report for the third quarter.

Sales of GM cars and trucks, while slightly below those of the preceding quarter, totaled nearly 1 million units, bringing the total to 2,877,089 cars and trucks for the first nine months. This may be compared with 2,167,512 for the same period of 1949.

Net income for the third quarter amounted to $217,377,767 compared with $198,735,386 during the same period of 1949. The report indicated that GM expects additional defense orders but that defense work has not affected commercial production during the past quarter.

Set Fourth Quarter Quota For Export of Copper Products

Washington—A fourth quarter quota of 30,000 tons has been set for export of copper and copper products, the Office of International Trade, U. S. Department of Commerce has announced.

The quota products and their schedule numbers are: 641200, refined copper in cathodes, billets, ingots, wire bars and other forms; 641300, copper scrap; 642200, copper pipes and tubes; 642300, copper plates, sheets and strips; 642400, copper rods and bars; 642500, copper wire and cable, bare (including copper weld electrodes); 643998, copper manufactures, n. e. s.; 709810, copper building wire and cable; 709830, copper weatherproof and slow burning wire; 709850, insulated copper wire, n. e. s., except rubber covered lamp cord.

The OIT said only 23,000 short tons of refinery shapes will be licensed under the 30,000-ton quota.

GM Gets "Oscar" for Star Report

Detroit—General Motors has been awarded the gold "Oscar of Industry" trophy for the best financial report of 1949.

Accepting the award in New York recently, Alfred P. Sloan, Jr., chairman of the board of General Motors, said he would like to see management, in a far broader way, popularize equities in the American enterprise.

Sloan emphasized the fact that GM recognizes that the annual report is an important connecting link between ownership and management. He argued that management should tell the story of how and why as well as the result of the year's business. To do this in understandable language, putting in a package that the stockholders will read with interest, he believes is an important obligation of management.

Tool, Die Men Squirm Under Labor Shortage

War booms business for contract tool and die shops but manpower has walked away under leaner times . . . Manpower Div. head warns industry from placing hopes in young.

Cleveland—War is proving the hope and damnation of the contract tool and die industry. It has hoisted it out of a business recession by stimulating civilian orders to such a point that now the industry aches from the shortage of skilled manpower that walked away when jobs were scarce. At the point where it must haunt the classified ad section for labor, the industry is also confronted by the greater bleeding of manpower by Selective Service.

Don't Rely on Young

That's why the speech of Col. Joel D. Griffing, Chief, Manpower Div., Selective Service System, was the object of heartfelt interest at the fifth annual meeting of the National Tool & Die Manufacturers' Assn. here.

"You'll find Mr. Peabody in a very jolly mood today."

He told members not to place key position hopes upon draft-eligible young employees. Review the draft status of every skilled employee between the ages of 19 and 35 and if deferments are essential for some, file requests at once with local Selective Service offices, he said.

The industry is especially sensitive to the draft because the average age of its workers is younger than at the start of World War II. Add this to the fact that the industry now has fewer men than 2 years ago and the total is aggravated manpower trouble.

Many members expressed hope that Selective Service will have mercy and issue a list of essential occupations to recognize the vital role their industry plays in rearmament. It makes the jigs, fixtures, special cutting tools, dies and molds without which machine tools and stamping presses could not operate.

Business Pickup Great

In an interview, Herbert F. Jahn, newly-elected president of the NTDMA and head of B. Jahn Mfg. Co., New Britain, Conn., said that since July 1 business pickup has been so great that most shops could employ about 50 pct more employees. About 80 pct of new order volume received by his firm since July 1 has been for defense.

Mr. Jahn declared that the in-

dustry had sufficient plant capacity to meet the production crisis but new machinery would be needed. Most plant machinery is now doddering at from 8 to 10 years old. He anticipates no shortage of tool steels and spoke favorably of the quality made during World War II.

Tool and die makers were told that they do not have to rely on influence-peddling 5-percenters in Washington to get their share of government contracts. Practically all needed information is available at local Commerce Dept. offices, said George A. Moore, regional director for the U. S. Dept. of Commerce.

News on the reconditioning of some reserve tools and their availability to shops with defense contracts on a lease basis was given by John H. Williams, Chief, Industrial Equipment Div., Office of Production Planning, Munitions Board. He said that there are about 60,000 machine tools available—many at 100 pct operating efficiency. Mr. Williams also praised the NTDMA for cooperation in a Munition Board survey of the industry. (See p. 29 for more details.)

Tripling in size since 1939, the industry consists of about 2500 small shops employing 45,000 workers. In 1950, production will be valued at $325 million.

Confabs on Carbides

The convention featured panel sessions on the use of carbides in tool and die shops, insurance coverage, and industrial mobilization planning.

Other officers elected were: first vice-president, R. H. Cope, comptroller, Bunell Machine & Tool Co., Cleveland; second vice-president, Alfred Reinke, Gus Reinke Machinery & Tool Co., Hillside, N. J.; secretary, Herbert C. Murrer, Murrer Co., Cincinnati; re-elected treasurer, Herbert Harig, vice-president Harig Mfg. Co., Chicago; re-elected executive secretary, George S. Eaton.

Personnel—Iron & Steel Div.

National Production Authority
Commerce Building, Washington 25
Phone Sterling 9200—Extension Indicated

		Room	Phone Ext.
Director	D. B. Carson	3830A	4455
	Sharon Steel Corp.		4456
			4346
			4347
Ass't. Director	F. T. McCue	3323	3962
	Chief, Iron & Steel Div.,		2369
	Dept. of Commerce		2328
Staff Assistant	J. Levin	3323	2273
Staff Assistant	R. X. McGowan	3327	3349
Staff Assistant	E. S. Moorhead	3819	3483
International Economist	J. J. W. Palmer	3319	2263
Staff Economist	R. M. Weidenhammer	3323	2214
Legal Counsel	R. Bronson	5121	4621
Stainless Steel	C. B. Boyne, Chief	3827	3323
	Allegheny Ludlum Steel Corp.		
Pig Iron	J. A. Claussen, Chief	3825	2343
	American Iron & Steel Inst.		
Alloy & Cold-drawn Bar	L. E. Creighton, Chief	3827	3323
	Rotary Electric Steel Co.		
Rails & Accessories	J. J. Davis, Jr., Chief	3819	3217
	Inland Steel Co.		
Program	C. Halcomb, Chief	3823	3152
			3171
Pipe & Tube	A. P. Happer, Chief	3316	2437
	National Tube Co.		4437
Priorities & Statistical Control	K. H. Hunter, Chief	3329	3974
Plant Expansion	H. L. Leyda, Chief	3309	3140
	General Steel Co.		
Tin Plate	A. M. Long, Chief	3825	3334
	Youngstown Sheet & Tube Co.		
Structural Shapes	R. A. Marble, Chief	3324	2767
	Carnegie-Illinois Steel Corp.		2988
Wire	N. F. Melville, Chief	3819	4656
	Pittsburgh Steel Co.		
	W. E. Mullestein, Chief	3324	2767
	Lukens Steel Co.		
Plate	W. E. Bossert, Ass't. Chief		2988
	Alan Wood Steel Co.		
Sheet & Strip	W. B. Quail, Chief	3320	2529
	Armco Steel Corp.		2700
Bars & Unfinished	J. W. Robinson, Chief	3326	3310
	Jones & Laughlin Steel Corp.		3151
Warehouse	A. Y. Sawyer, Chief	3312	2050
	Jos. T. Ryerson & Son, Inc.		2681
Forgings	H. F. Weaver Chief	3310	2004
	Bethlehem Steel Corp.		
	J. E. Sweeney, Ass't. Chief		2609
	Kropp Drop Forge Co.		

Castings (to be organized) Not all personnel have been sworn in.

British Advocate Tin Agreement

London—An international tin agreement has been strongly advocated by representatives of British Colonial Territories at the United Nations Conference at Geneva. Clarence Nichols, U. S. delegate, has expressed the view that an agreement would be premature.

While tin recently changed hands in London at a record high of £925 per gross ton, it was pointed out that previous recommendations for a tin agreement, made in a period of lower price levels, had not yet been invalidated.

Predicts Rise in Coal Use

Washington—Long-range trends indicate an increased coal use, according to H. B. Baird, of Eastern Gas & Fuel Associates. While there will be further gains in the use of gas and oil in the years immediately ahead, Mr. Baird said the nation's estimated population in 1975 of 180 million will require 580 million tons of coal, 73 million tons more than is used now.

Scrap Institute Seeks Lower Rates on Rail Moves in South

Washington — The Interstate Commerce Commission this week was asked to order a 20 pct rate reduction on scrap moved by southern railroads.

The Institute of Scrap Iron and Steel, Inc., told the ICC that scrap rates were "away out of line" with current rates on other commodities.

The scrap industry points out that some steel products can move more cheaply than scrap, under existing rail rate schedules. For example, the rail rate on steel sheets from Youngstown to Detroit is lower than the rate on scrap from Detroit to Youngstown.

In the South—which normally is a surplus scrap area—pig iron can move to northern consuming areas cheaper than scrap.

ISIS told the ICC that the present rates on scrap moving from the South of $10 to $18 per gross ton are "discriminatory", and are geared to "obtain just as much as the traffic will bear". The institute said a 20 pct cut in rates would "restore to rail movement more than 500,000 tons of scrap which currently moves by barge in addition to producing an additional 300,000 tons of scrap which, because of freight rates, must remain dormant".

Thompson Earnings at Peak High

Cleveland — Thompson Products, Inc., reports net earnings for first 9 months of 1950 exceeded the total of all of 1949 when profits hit an all-time peak. Earnings for the period ended Sept. 30 were $6,415,763. This compares with $4,397,842 in the same period of 1949.

Curtiss Sees Future in Props

Caldwell, N. J.—Speeds up to 1000 mph with long-range propeller-driven aircraft may be reached through an advanced series of subsonic, trans-sonic, and supersonic propellers, disclosed the Propeller Div. of the Curtiss-Wright Corp., this city. Although the newly-announced props will be used in planes with 500 to 600 mph cruising speeds, research indicates that twice present speeds are possible for propeller-driven planes.

U.S. Steel to Weld Firms Into 1 To Simplify Corporate Structure

New York—Four wholly-owned U. S. Steel Corp. subsidiaries will be welded into a single operating entity, the U. S. Steel Co., as of Jan. 1, 1951, to "simplify the corporate structure" of the parent firm, announced Irving S. Olds, chairman of the board of directors, this week.

The subsidiaries are: U. S. Steel Corp. of Delaware, Carnegie-Illinois Steel Corp., H. C. Frick Coke Co., and United States Coal and Coke Co. Continuing as president of the parent company, Benjamin F. Fairless will head the new single subsidiary. He is now president of U. S. Steel Corp. of Delaware also. U. S. Steel Co. headquarters will be in the new office building now being built in Pittsburgh.

Its five executive vice-presidents will be: Clifford F. Hood, president of Carnegie-Illinois, in charge of operations; David F. Austin, commercial; Roger M. Blough, law and secretarial; Malcolm W. Reed, engineering, and George W. Rooney, accounting. The last four are officers of U. S. Steel Corp. of Delaware.

Coal Co. Reports on Earnings

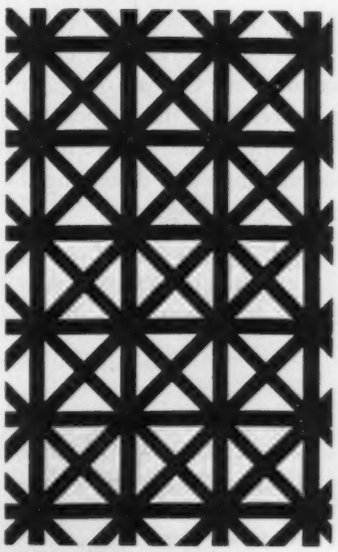
Pittsburgh — Pittsburgh Consolidation Coal Co. reported profits of $4,235,583 for the quarter ended Sept. 30, 1905. This compares with earnings of $2,053,511 for the third quarter of 1949.

Hendrick Ornametal

TRADE MARK

This is a lightweight type of grille especially suited for radiator enclosures, stove panels, kitchen cabinets, clothes and broom closets, lockers, and similar applications. It is made of a special bright finish, cold rolled steel, suitable for painting or plating, and is available in a wide range of stock size sheets and gauges.

Hendrick Ornametal can be furnished in a variety of attractive designs, the one illustrated being "Smalcane." Write for full information.



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Await Supreme Court Rule On Delivered Price Problem

Washington — The Supreme Court again has under advisement a case involving an important facet of the delivered price problem.

This is the Standard Oil of Indiana case which was argued before the court last term but no decision was handed down and it was put aside for reargument. It was the first case heard by the court when it reconvened 2 weeks ago.

The question at issue is whether Standard can lower prices to meet those of competitors if the price-cutting results in injury to competition among its customers.

Standard offered as a complete defense the fact that it had acted in "good faith". The Federal Trade Commission said "good faith" was not enough because competition had been hurt at the retail level.

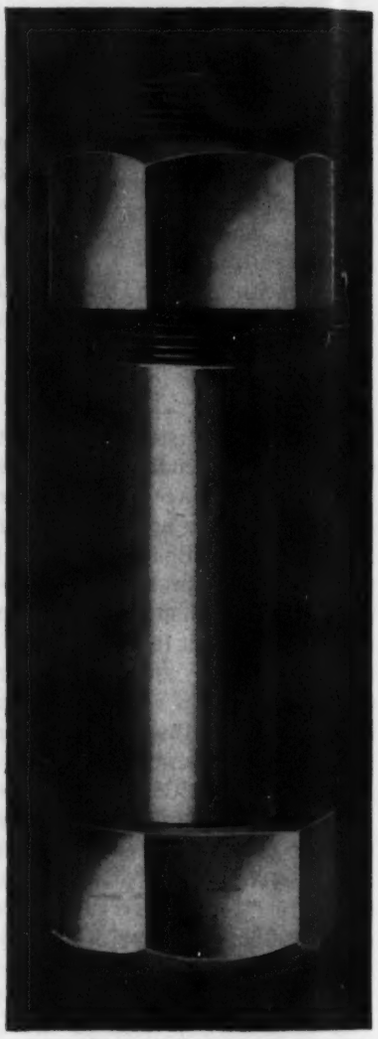
The Appellate Court upheld FTC. The so-called basing point bill, S. 1008, vetoed by the President, would have upheld Standard. Hence, the business community's interest in this case. While the court ducked the case during the last term, a ruling is definitely expected during the present session, although not for many weeks.

Sloss-Sheffield to Add Ovens

Pittsburgh—Sloss-Sheffield Steel and Iron Co., Birmingham, Ala., has ordered a new battery of 30 coke ovens from the Koppers Co., and work will begin immediately on their construction. Cost of the new ovens will be approximately $2 million. When completed, the additions will give Sloss-Sheffield 150 ovens with a coal carbonizing capacity of 3280 net tons per day, an increase of 580 net tons.

New England Group to Meet

Boston—New England's part in the defense production program will be discussed at the 25th New England Conference at the Hotel Statler Nov. 16 and 17.



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Pennsy's Tunnel Headaches Lightened by Modernization Job

Spend $9 million, 17 months work; Estimate $1,400,000 annual saving

Pittsburgh—It cost the Pennsylvania Railroad $9 million and 17 months' work, but it was worth it—five tunnels that had been giving the railroad and shippers costly headaches for years have finally been eliminated.

The trouble-making tunnels, situated along an important 45-mile stretch between Steubenville and Dennison, Ohio, were too small to accommodate today's big freight cars and high, wide open loads. As a result, there were costly shipping delays as big cars were screened out and rerouted, not to mention $1,400,000 per year in additional operating costs. Approximately 85,000 cars were being detoured annually.

To solve the problem, the railroad by-passed two of the tunnels, replaced two others with open cuts and modernized the fifth so that it will be able to handle the big stuff.

The job was started in June 1949 and was scheduled for completion Nov. 15. Contractors have had to haul away the equivalent of 185,000 carloads of earth. Numerous curves were eliminated and miles of track re-aligned.

Alabama Power Wants Coal Land

Washington—Alabama Power Co. of Birmingham has applied to the Securities & Exchange Commission for permission to buy 16,000 acres of land and mineral rights from Alabama Iron & Fuel Co. The property is estimated to contain about 76,000,000 tons of recoverable coal. Price involved was given as $1,250,000.

Bauxite Imports Heavy at Mobile

Mobile, Ala.—Heavy incoming shipments of bauxite ore from Surinam boosted Mobile customs district imports during August, the U. S. Department of Commerce reports. August bauxite ore imports amounted to $750,000.

New BURNEK best for your barrels

BURNEK* is Wyandotte's new burnishing compound. Burnek is ideal for brass, copper, nickel, silver and gold. And it's useful for some operations on aluminum and its alloys, zinc, steel and stainless steel.

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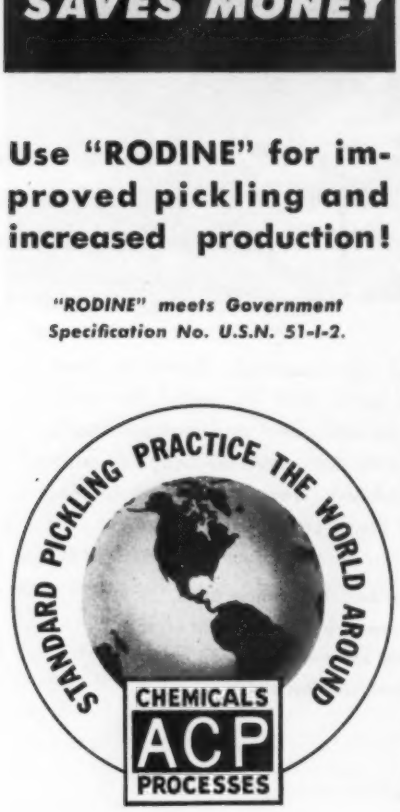

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"Cuprodine" coats both carbon and stainless steels with a thin, bright, adherent layer of copper. This coating prolongs die life and improves the drawing of wire, rod and tubing.

Write for Descriptive Folder

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Southern Line Plant Works Extra Shift for Charity's Sake

Birmingham—White collar and production workers of the Southern Line Material Co., electrical equipment manufacturers here, can be good samaritans and contribute to charity without losing a cent in take-home pay.

Saturday Oct. 28, ordinarily a day off for workers, was Good Neighbor Day at Southern Line and both plant machines and office typewriters were busy. Plant men filed into the plant at 6:30 a.m. and worked 5 hours through 11:30 a.m. Office personnel worked 8:00 a.m. through 11:30 a.m. and last week finished off the extra 5 hours with 30 min after-hours shifts.

All this money earned plus the company's profits of one day's regular production will go into a charity fund to cover donations to eight major fund drives made in Birmingham each year. After the shift for charity, a luncheon was held and after that was over employees had the choice of returning to their machines and working for themselves at time and a half. The fund is administered by factory men.

Phillips Buys Ironton Property

Cincinnati—Phillips Pump & Tank Co. has purchased the land and buildings of the former Ironton Engine Co. Phillips recently became a wholly-owned subsidiary of Wayne Pump Co., Fort Wayne, Ind.

The Ironton Engine Co. was dissolved last June and the property was bought by Robert and Joseph Stern, who disposed of the machinery at auction. A Phillips official said operations at Ironton would be started in the near future.

GAEX-DF Freights Begin to Roll

New York—With the first of the new GAEX-DF all steel, 50 ft freight cars coming off the production line at the rate of 15 a day, The General American-Evans Co., of Detroit, announced its first run of 360 cars will be complete in 30 days. Under an agreement with Prudential Insurance Co. of America, General American will make 100,000 of the cars at a cost of $1 billion. As made, the cars will be allocated to railroads under leasing arrangements.

Last Paychecks

Birmingham—Final paychecks were handed out to 275 workers of the 34-year-old Boothton Coal Co., near this city, last week. The company's last two mines were closed forever because of high production costs resulting from the depth of the mines and inability to meet prices of other fuels.

President Darius A. Thomas said that miners will be allowed to live in company-owned houses until other arrangements can be made and that efforts will be made to place unemployed men in other mines.

Alcoa Man Gets Legion of Merit

Pittsburgh—For "exceptionally meritorious service" in the conservation and use of electric power in critical areas during World War II, James P. Growdon, chief hydraulic engineer for Aluminum Co. of America, has been awarded the Legion of Merit by the Army.

Mr. Growdon, a veteran of both World Wars, served as Chief, Electric Power Mission, Headquarters, Allied Military Government, and Chief, Electric Power Mission, Allied Control Council, from November 1943 to July 1944, holding the rank of Colonel.

Porter Has Plans for Connors

Birmingham—H. K. Porter Co., of Pittsburgh, has expansion for its recently acquired Connors Steel Co., here. It intends to spend over half a million dollars on improved heating furnaces, enlarged rolling mill facilities, and plant layout. The project will begin as soon as depreciation certificates can be obtained from the government. Connors Steel has a rated production of 90,000 tons a year.

Unions to Promote Industry, Says Management Meet Speaker

New York—To preserve their identity and freedom, trade unions will one day "operate in aggressive support" of management because free unions can only exist in a free society, said Gen. Robert W. Johnson, of New Brunswick, at the annual fall conference of the Society for advancement of Management held at the Hotel Statler here last week.

The inconsistency of some branches of organized labor in rallying against inflation and yet screeching against imposition of credit controls was described by Ray Suter, Ohio Chamber of Commerce. He warned that management does not wish a repetition of the type of manpower controls set up for World War II. He said signs were strong for direct price and wage control machinery.

A. B. Dick, III, of A. B. Dick Co., spoke on "Plans and Practices of Expanding Plant Facilities". George C. Houck, of the Harris-Seybold Co., Cleveland, spoke on "Production Flexibility in Partial Mobilization". Max Bass, employee publications manager, Caterpillar Tractor Co., spoke on "Effective Communications".

Coal Output Climbs—Not Enough

London—Although six of the principal European coal-producing countries increased their total hard coal output by an average of almost a million tons a month over 1949, the United Nations Economic Commission for Europe said that production is still below the goal. Higher coal and coke production and exports will also be needed to meet greater steelmaking demands in 1951.

National Lead Earnings Reported

New York—National Lead Co. earnings in the first 9 months of 1950 amounted to $18,902,074 compared with $10,779,881 for 9 months in 1949.

Cleaner Castings WITH ALSIMAG® Ceramic STRAINER CORES

When a casting is bad you lose molder time, helper time, furnace tender time and, often, machinist time. AlSiMag Strainer Cores help prevent this by giving you cleaner castings every time.

ALSIMAG STRAINER CORES (skimmer cores) are flat, precision made, ceramic gate strainers. They strain the incoming metal and distribute its flow evenly, greatly reducing the possibility of sand, dirt or slag in castings. The result is more good castings per molder per hour. Foundries now using these cores in quantity praise these features:

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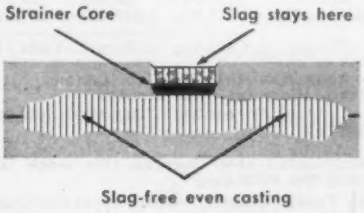
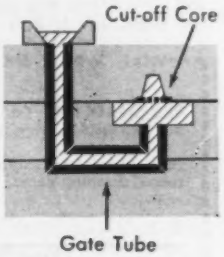
- Even thermal expansion
- Withstand all normal pouring temperatures
- Tough, easy to use on fast production



ALSIMAG CUT-OFF CORES are used in the riser to form a weak joint between riser and casting. This enables the floor man to break riser off easier and cleaner just after shake out. Eliminates cut-off time. These flat ceramic cores bring economy into any foundry pouring large castings.

Cameron Cores Patent Number 2313517.

ALSIMAG GATE TUBES are used to keep contamination from gate walls going into casting. With these tubes in place there is less chance of foreign matter getting into the casting. The metal flows through a smooth, kiln fired ceramic tunnel gate all the way to the casting . . . an added assurance that your castings will be better.



TRY THESE CERAMIC PRODUCTS AT OUR EXPENSE

Test AlSiMag products in your own foundry. Additional uses, other than those mentioned above, are possible. Samples of AlSiMag materials in stock will be sent free on request. Test samples to your own specifications will be supplied at a minimum cost.

ALL ALSIMAG PRODUCTS, READY FOR IMMEDIATE USE BY THE MOLDER, COME PACKED IN HANDY STURDY CARTONS

AMERICAN LAVA CORPORATION

CHATTANOOGA 5, TENNESSEE

49TH YEAR OF CERAMIC LEADERSHIP

OFFICES: Philadelphia • St. Louis • Cambridge, Massachusetts • Chicago
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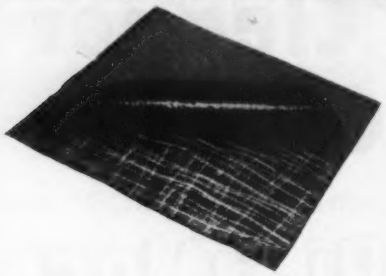
IT PAYS TO PACKAGE YOUR PRODUCTS IN FIBREEN

REINFORCED WATERPROOF PAPER



FIBREEN is the No. 1 wrapping material for complete protection of your shipments of steel sheets, metal parts and assemblies, or finished products. Only in FIBREEN will you find all of these essential protective qualities:

1. It's STRONG, because it is reinforced with closely cross-laid sisal fibres.
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IT'S DUST-PROOF • IT'S PLIABLE IT'S ECONOMICAL

FIBREEN has served steel mills and metal-working industries for over 20 years. Qualified consultants are available to help you use FIBREEN to best advantage.

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• News of Industry •

STEEL CONSTRUCTION NEWS

New York — Bookings of fabricated structural steel for September amounted to 249,315 tons, slightly less than the previous month, but up some 107 pct over the corresponding month in 1949. According to reports received by the American Institute of Steel Construction, Inc., the first nine months of 1950 totaled 1,821,256 tons, the highest since 1941 when 1,837,874 tons were reported for the same period.

September shipments for this year were 155,960 tons, somewhat lower than the previous month, but practically equal to the 1950 average monthly rate of 155,998 tons. The total shipments for nine months of 1950 were 1,403,982 tons, or about 6 pct less than reported for the same months last year.

The backlog (tonnage of orders booked and available for future fabrication) for the next four months only, decreased slightly to 716,393 tons.

	Estimated Total Tonnage for the Entire Industry		
Contracts Closed	**1950**	**1949**	**Avg. 1936-1940**
January	119,317	130,418	107,578
February	117,664	108,764	96,280
March	189,420	149,079	124,558
April	155,011	98,802	110,783
May	192,319	116,975	126,237
June	266,612	96,952	125,835
July	272,583*	126,255	152,481
August	259,015*	98,953	113,135
September	249,315	120,373	137,982
Totals	1,821,256	1,046,571	1,094,869
Shipments			
January	135,253	152,746	92,578
February	129,628	145,879	88,626
March	156,781	185,885	115,031
April	164,440	179,206	123,650
May	168,113	171,101	123,225
June	172,096	172,260	129,969
July	141,467*	147,960	127,422
August	180,244*	183,868	136,389
September	155,960	162,139	137,255
Totals	1,403,982	1,501,044	1,074,145
Tonnage Available for Fabrication Within the Next Four Months	716,393	562,211	362,278

* Revised

Fabricated steel awards this week included the following:

1546 Tons, Boston, steel superstructure for channel span between Boston and Charlestown near Warren Bridge (part of new Boston Central Artery) to American Bridge Co., Pittsburgh.

1250 Tons, La Porte, Ind., Bldg. No. 85 for Allis-Chalmers Mfg. Co., to Mississippi Valley Structural Steel Co.

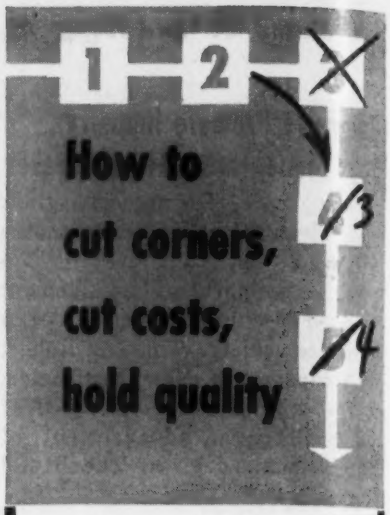
1100 Tons, Chesterfield, Va., extension to power station, Virginia Power and Electric Co., through Stone & Webster, Inc., Boston, to Bristol Steel and Iron Co., Bristol, Va.

1000 Tons, Broomfield, Colo., bridge project T-170-1/3, to Allied Structural Steel Co., Chicago.

650 Tons, Chaison, Tex., extension of Neches power station for Gulf States Utilities Co. through Stone & Webster, Inc., Boston, to Consolidated Western Steel Co., Beaumont, Tex.

580 Tons, Chicago Medical Center Residence Halls, to American Bridge Co.

476 Tons, Monmouth Junction, N. J., railway bridge for Pennsylvania



OAKITE metal-cleaning procedures can make an entire production operation easier, cheaper, quicker. Three examples:

1. Pre-Paint Treatment Saves $800 Monthly That's what an electrical manufacturer credits to the OAKITE CrysCoat PROCESS, which cleans and phosphates simultaneously.

2. New Brass Cleaner Makes Big Savings A large plating job shop cleans brass with a new Oakite formula that minimizes tarnishing and rejects; cleans so well that, in many cases, a copper strike is dropped from the plating cycle.

3. Eliminates Pickle A maker of radio transmitters (using Oakite Compound No. 33 to remove rust and oil at same time) reports: "No longer necessary to pickle the steel."

FREE Write Oakite Products, Inc., 30H Thames St., New York 6, N. Y., for the new 44-page booklet *"Some good things to know about Metal Cleaning"*. Among the subjects are:

Machine cleaning	**Tank cleaning**
Electrocleaning	**Pickling**
Pre-paint treatment	**Barrel cleaning**
Paint stripping	**Burnishing**
Steam-gun cleaning	**Rust prevention**

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS • METHODS • SERVICE

Technical Service Representatives Located in Principal Cities of United States and Canada

"I believe every company should..."

MR. CLARENCE FRANCIS

Chairman of the Board, General Foods Corporation

"I believe every company should conduct a person to person canvass right now, for the best way to promote the sale of U. S. Savings Bonds is to put an application card into each employee's hand and allow him to reach his own decision."

As one of America's top executive salesmen, Mr. Clarence Francis knows that you sell more when you "ask the man to buy." Naturally, that means a person to person canvass of *all* your employees, but it is not as difficult as it may sound. In fact, it is very simple:

Tell your employees personally—or over your signature—why the automatic purchase of Savings Bonds through the Payroll Savings Plan is good for them and their country.

Designate your Number One Man to organize the canvass and keep it moving.

Enlist the aid of employee organizations—they will be glad to cooperate with you.

With posters, leaflets, and payroll envelope enclosures remind your employees of the many benefits of the Payroll Savings Plan. Your State Director, U. S. Treasury Department, Savings Bonds Division, will furnish you, free of charge, all the promotional material you can use.

Be sure that every man and woman on the payroll is given a U. S. Savings Bond Application Form.

Thousands of companies, large and small, have just completed or are now conducting person to person canvasses. Their reports are a challenge to every company that does not have a Payroll Savings Plan . . . 50% employee participation . . . 60% employee participation—some of them have gone over 80%.

All the help you need to conduct your person to person canvass is available from your State Director, U. S. Treasury Department, Savings Bonds Division. Get in touch with him.

The U. S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the G. M. Basford Company and The Iron Age.

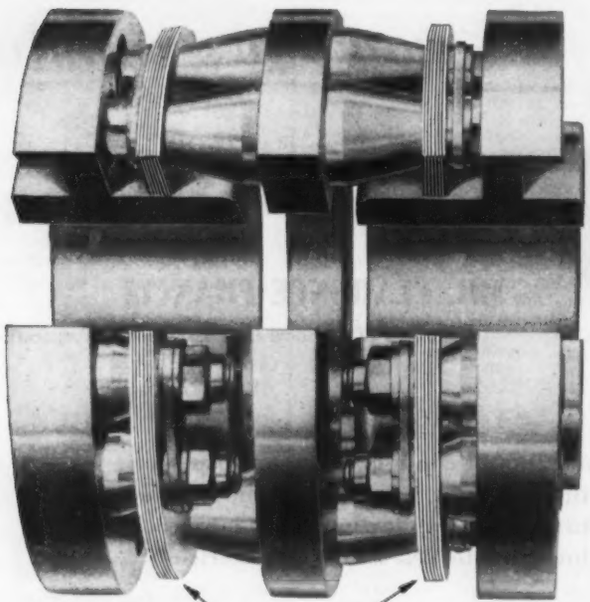
THOMAS *Flexible* ALL METAL COUPLINGS

FOR POWER TRANSMISSION • REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings have a wide range of speeds, horsepower and shaft sizes: ½ to 40,000 HP — 1 to 30,000 RPM.

Specialists on Couplings for more than 30 years



PATENTED FLEXIBLE DISC RINGS

BACKLASH FRICTION WEAR and CROSS-PULL are eliminated LUBRICATION IS NOT REQUIRED!

THE THOMAS PRINCIPLE GUARANTEES PERFECT BALANCE UNDER ALL CONDITIONS OF MISALIGNMENT.

• • •

NO MAINTENANCE PROBLEMS.

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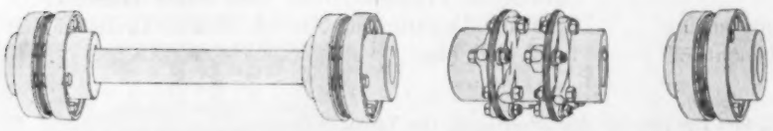
ALL PARTS ARE SOLIDLY BOLTED TOGETHER.



Write for the latest reprint of our Engineering Catalog.

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

Railroad, to American Bridge Co., Pittsburgh.

430 **Tons,** Delaware County, Pa., highway bridge for Pennsylvania Dept. of Highways. Berlanti Construction Co., low bidder.

372 **Tons,** New Orleans, La., Jefferson Davis overpass for City of New Orleans, to Virginia Bridge Company, Birmingham, Ala.

225 **Tons,** Cook County, Ill., bridge section 263-1515-1, to American Bridge Co.

210 **Tons,** Freeport, Ill., bridge for Chicago, Great Western Railway, to American Bridge Co.

Fabricated steel inquiries this week included the following:

3200 **Tons,** Allegheny County, Pa., viaduct for Pennsylvania Dept. of Highways. Bids due Dec. 8.

2200 **Tons,** Westmoreland and Indiana Counties, Pa., bridges for Pennsylvania Dept. of Highways. Bids due Dec. 8.

2158 **Tons,** Westmoreland and Indiana Counties, Pa., construction of three (3) I-beam bridges and approaching highway for Pennsylvania Dept. of Highways, Harrisburg, Pa. Bids due Dec. 8, 1950.

900 **Tons,** Philadelphia, Wharton Business School, University of Pennsylvania. Bids due.

560 **Tons,** Indiana County, Pa., bridges for Pennsylvania Dept. of Highways. Bids due Nov. 10.

390 **Tons,** Wilkes-Barre, Pa., construction of deck plate girder and an I-beam bridge and aggregate base for Pennsylvania Dept. of Highways, Harrisburg, Pa. Bids due Nov. 22.

390 **Tons,** Luzerne County, Pa., reconstruction of bridge for Pennsylvania Dept. of Highways. Bids due Nov. 22.

360 **Tons,** Allegheny and Westmoreland Counties, Pa., bridges for Pennsylvania Dept. of Highways. Bids due Nov. 22.

360 **Tons,** Cumberland County, Pa., bridge for Pennsylvania Dept. of Highways. Bids due Nov. 10.

Reinforcing bar awards this week included the following:

370 **Tons,** Upper Darby, Pa., high school building, Wark & Co., Philadelphia, general contractors, to Bethlehem Steel Corp., Bethlehem, Pa.

350 **Tons,** Washington, new building for National Assn. of Letter Carriers, Houser Construction Co., Philadelphia, general contractors, to Bethlehem Steel Corp., Bethlehem, Pa.

250 **Tons,** Kingsport, Tenn., new plant for Penn-Dixie Cement Co., E. C. Machin, Inc., Allentown, Pa., general contractor, to Bethlehem Steel Corp., Bethlehem, Pa.

200 **Tons,** Philadelphia, warehouse for Gulf Oil Co. H. E. Baton, same city, low bidder.

200 **Tons,** Philadelphia, building for Electrical Storage Battery Co. Wm. F. Lotz, same city, general contractor.

200 **Tons,** Philadelphia, kitchen facilities, Philadelphia State Hospital. Wark & Co., same city, general contractor, to Bethlehem Steel Corp., Bethlehem, Pa.

200 **Tons,** Birmingham, Ala., blast furnace and ore bins for Woodward Iron Company, to Truscon Steel Co., Birmingham, Ala.

Reinforcing bar inquiries this week included the following:

525 **Tons,** Westmoreland and Indiana Counties, Pa., construction of three (3) I-beam bridges and approaching highway for Pennsylvania Dept. of Highways, Harrisburg, Pa. Bids due Dec. 8, 1950.

208 **Tons,** Allegheny, Westmoreland Counties, Pa., construction of pavement including the extension of an existing structure, seven concrete structures, one concrete bridge and one plate girder bridge; divided highway; three concrete bridges and one I-beam bridge for Pennsylvania Dept. of Highways, Harrisburg, Pa. Bids due Nov. 22.

Fork trucks are not always the answer

This Elwell-Parker High Lift truck is 30% lighter than comparable fork models—leaving more floor-load capacity for handling and storage

This Elwell-Parker ELN-6T has had its platform replaced with forks to handle palletized loads. Total weight with battery is 2 tons *less* than a fork truck of same load capacity (6000 lbs.) . . . Fork trucks are heavier because they must be counterweighed to balance the outboard load, whereas on high lift models, the forward underframe and wheels support much of the load.

On many jobs, particularly in older buildings, this advantage is very important:—More goods can be tiered higher on the same floor space. Where floor or elevator capacities are limited, high lift models are often the *ONLY* type of tiering truck that is practical. Load stability is greater. In addition, high lift trucks cost less.

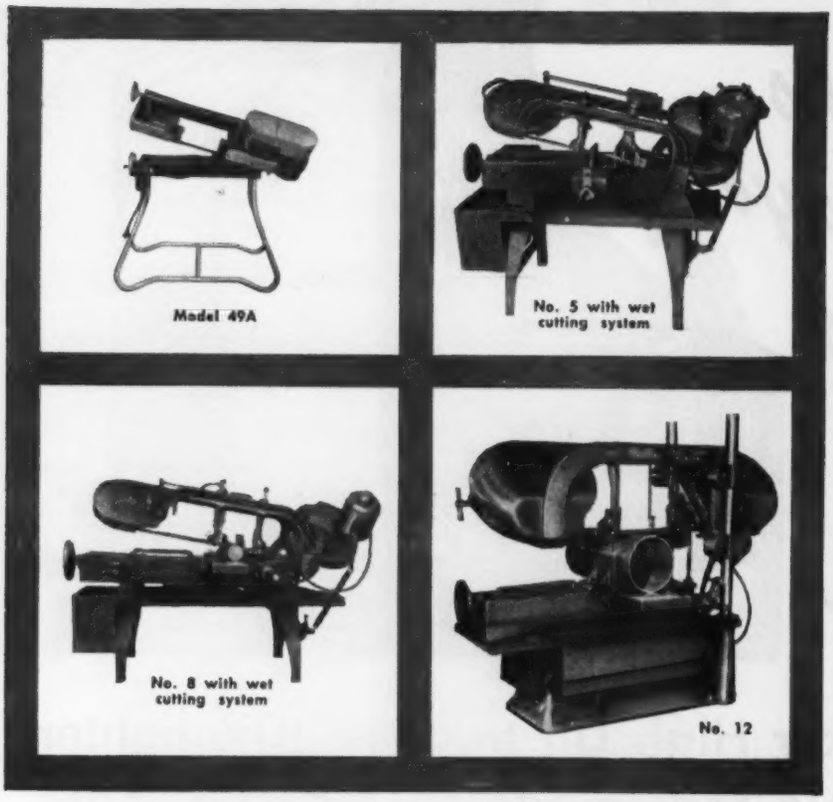
ELWELL-PARKER OFFERS YOU UNBIASED ADVICE **whatever your truck needs. Its line is not restricted. Included are ALL basic types—fork, high lift, low lift, cranes, tractors. Available in over 40 sizes and models. Let us have an EP man recommend trucks for *your specific requirements*. The Elwell-Parker Electric Company, 4075 St. Clair Ave., Cleveland 3, Ohio.**

ELWELL-PARKER
POWER INDUSTRIAL TRUCKS
Established 1893

FREE BOOKLET
fully explains scientific materials handling. Ask for "Industrial Logistics".

One of these four Wells Saws

is the answer to your metal cut-off problems



IN the recently expanded line of Wells horizontal metal cutting band saws there is a standard model to meet every cut-off need up to 12" x 16" . . . and special models for larger jobs. This means that the cost-cutting advantages of modern, continuous band saw cutting are available for all shops, regardless of size. Choose from the following, the saw that best suits your requirements:

MODEL 49A—Portable, economically priced unit yet capable of a man-sized job in any shop. Capacity: 3½" dia., rounds; 3½" x 6" rectangular.

No. 5—All purpose utility saw. Capacity: 5" dia., rounds; 5" x 10" rectangular. Available with or without wet cutting system.

No. 8—General maintenance or production saw. Capacity: 8" dia., rounds; 8" x 16" rectangular. Available with or without wet cutting system.

No. 12—Heavy-duty wet cutting production saw with automatic cutting cycle. Capacity: 12¾" dia., rounds; 12" x 16" rectangular.

Our 25th year of service

For automatic precision repetitive cutting Wells No. 8 and No. 12 saws can be equipped with Wells-O-Bar Feed Master stock projection units.

Write today for descriptive literature and information on the Wells Saws which you need for your job requirements.

Wells Saws

Wells

The Pioneers of Horizontal

METAL CUTTING BAND SAWS

WELLS MANUFACTURING CORPORATION
202 WASHINGTON AVE., THREE RIVERS, MICH.

GE Opens Measurements Lab

Lynn, Mass.—Dedicated to the progress of measurements, the General Electric Co. opened its new measurements laboratory here. It is staffed by engineering specialists in metallurgy, magnetism, electricity, chemistry, heat, light, and color and contains facilities for applied research, product development and design in the measurements field.

H. E. Strang, GE divisions manager, predicted that the total value of measuring apparatus produced each year will climb from the present $600 million to more than $1 billion in the next 10 years.

U. S. Office for French Plants

Paris—To earn badly-needed dollars for France, Jean Constant, president of the French Assn. of Metalworking Industries, plans to open an American office to represent 8000 French metal fabricating plants producing metal products and parts. Mr. Constant stated that French factories are now able to produce to American specifications. Pending establishment of his U. S. office, Mr. Constant is at the Syndicat General Des Industries Mecaniques et Transformatrices Des Metaux, 11 Avenue Hoche, Paris, France.

Sloss-Sheffield Gets Safety Award

Birmingham—For the fifth consecutive year, the National Safety Council's fleet safety contest trophy has been awarded Sloss-Sheffield Steel & Iron Co. From July 1949 through June 1950 Sloss-Sheffield city division trucks were driven 110,968 miles without accident.

Penn RR Places Rail Orders

New York—Orders for 96,000 net tons of steel rail, costing $6,600,000, have been placed by Pennsylvania R.R. with Carnegie-Illinois Steel Corp., Bethlehem Steel Co., and Inland Steel Co. The orders are split about equally among 155, 140, and 133 pound rail sections.

The Baird 76H Chucking Machine has Versatility

combines turning, drilling, tapping, threading, milling and other operations.

Some of the EXCLUSIVE FEATURES, which have made the Baird 76 Six-Spindle Horizontal Indexing Lathes outstanding are:

INDEPENDENT TOOL SLIDES

The longitudinal tool slides may have different strokes and the cross slides are independent and have their strokes set to just suit the job. All tool slides have micrometer adjustment.

DIFFERENT SPEEDS AT SPINDLES

Ability to choose a speed for the spindle at each work station to suit the operation to be performed at the station permits the best product in least time.

AUTOMATIC CHUCKING

Operator has more nearly free to handle the work.

No levers or handles to require his attention or

ATTACHMENTS

Several readily applied attachments are available to perform extra operations and reduce handling, thus speeding production.

AUTOMATIC MECHANICAL STOP

Stops machine at end of each cycle if operator has not unloaded and reloaded in the proper operation of machine. This and other safety features make for least loss due to damage, and for greatest safety.

"ASK BAIRD ABOUT IT"

OTHER BAIRD MACHINES—MULTIPLE SPINDLE AUTOMATIC BAR MACHINES—SINGLE SPINDLE AUTOMATIC CHUCKING MACHINES—TURRET LATHES

THE BAIRD MACHINE COMPANY

STRATFORD, CONN.

Cut Cost—Add Strength
Your quantity-run special fastener type parts made
EXTRA FAST
by the Kaufman Process
Hold your costs down on out-standard headed and threaded parts. Many users are surprised at the economy and production speed possible, and the superior strength of most items when made by the Kaufman Process. Your specifications as to steel and heat treatment are carefully followed, or checked by our laboratory when desired. Send blue prints and specifications for estimate. The Cleveland Cap Screw Company, 2917 East 79th Street, Cleveland 4, Ohio.
CLEVELAND
Top Quality
FASTENERS
ORIGINATORS OF THE
KAUFMAN DOUBLE EXTRUSION PROCESS
Specialists for more than 30 years in
CAP SCREWS, SET SCREWS, MILLED STUDS
Ask your jobber for Cleveland Fasteners

British Auto Public Sees Cars With 10-Year Waiting Lists

London—British autos, some of them with 10-year waiting lists, were shown at the annual motor show here. Few of the throngs seeing the exhibit had a chance of getting a new car within 5 years because of a strict priority given to exports. England has become a land of antiquated automobiles. About 1,500,000 vehicles are 11 years and older.

Shown were new Ford models, the 4-cylinder Consul, the 6-cylinder Zephyr, and new Austin models. W. Lyons, president of the Society of Motor Manufacturers and Traders, said that competition in the export field may increase. He warned that it may arise from France, Germany, Italy, Czechoslovakia and Australia.

Oswego Gets New Power Unit

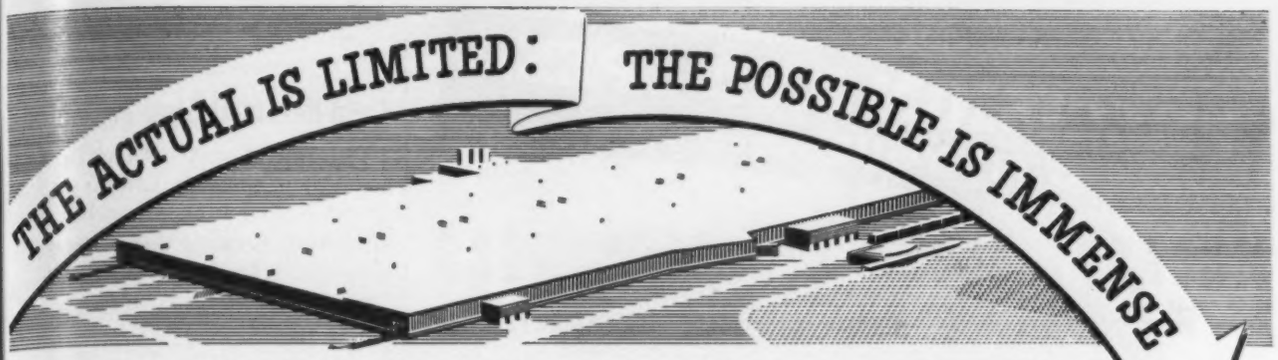
Oswego, N. Y.—Installation of an 80,000 kw steam generating unit is being made at the Niagara Mohawk Power Corp.'s steam station here by Babcock & Wilcox Corp. The unit, number four at the plant, will boost total output to 240,000 kilowatts and furnish power for Syracuse and central New York State.

Set Industry Council Meeting

Cincinnati — The Council of Profit Sharing Industries, representing 250 member firms with nearly 300,000 employees, will meet for its third annual conference at the Netherlands Plaza Hotel here on Nov. 30 and Dec. 1. Theme will be "Profit Sharing—An Arm of Fredom."

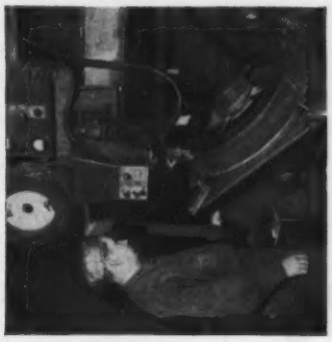
British Renew Control Bills

London—The government can now reimpose direction-of-labor controls and allocate raw materials in the rearmament program through renewal of the Supplies and Service Act and the Defense Regulations. The Labor Party is now intent in perpetuating wartime economic controls and extending nationalization.



NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

WELDED DESIGN CUTS PRODUCTION COSTS
. . . opens new markets for machinery builder



Automatic Welding *of typical motor end bracket . . . produces smooth, uniform bead, saves manual cleaning operations to cut production costs.*

Original Construction *of electric motor and generators built by The Electric Products Company, Cleveland, Ohio.*

Present Welded Design *weighs less, operates cooler, has greater overload capacity, requires less maintenance.*

THE need for less material with welded design . . . fewer man-hours for machining and assembly is cutting production costs from 10% up to nearly 50% as on the part shown below.

The immensity of the possible is being indicated also in expanding opportunities for new business now being realized at The Electric Products Company, Cleveland, Ohio. By making possible product modifications at low cost to meet specialized needs, arc welding is daily tapping additional sources for sales.

Improved performance, cooler operation and less maintenance are resulting from better electrical characteristics of welded steel construction . . . from compact, rugged design permitting larger core openings and more efficient ventilation.

the ACTUAL

ORIGINAL DESIGN

increasing the YIELD

PRESENT WELDED DESIGN

the IMMENSITY of the POSSIBLE turns out to be a 50% SAVING IN COST

SEE HOW ARC WELDING IMPROVES PRODUCT ACCEPTANCE

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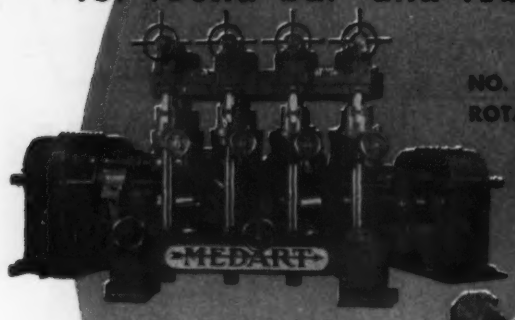
Machine Design Sheets free on request. Write Dept. 512,

THE LINCOLN ELECTRIC COMPANY

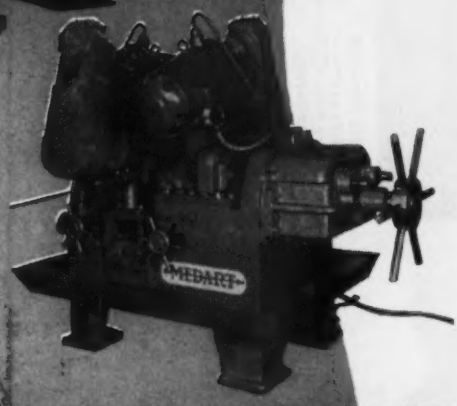
CLEVELAND 1, OHIO

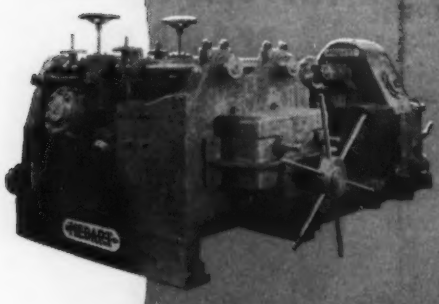
PRECISION AND SPEED
TO FIT YOUR NEED . . .
MEDART ROTARY STRAIGHTENERS
for round bar and tubular products



NO. 3 SIZE MEDART MULTICYCLE ROTARY STRAIGHTENING MACHINE

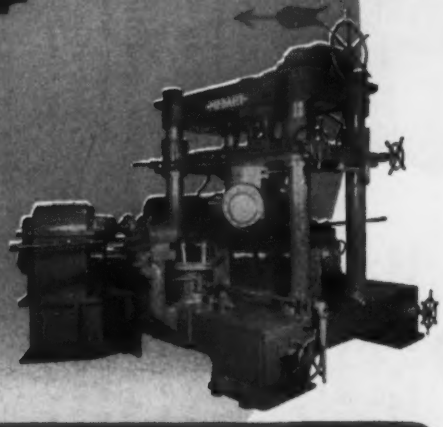
NO. 3 SIZE MEDART 2 & 2 ROTARY STRAIGHTENING, SIZING AND POLISHING MACHINE





NO. 3 SIZE MEDART TWO ROLL SINGLE MOTOR ROTARY STRAIGHTENING, SIZING AND POLISHING MACHINE

NO. 3 SIZE MEDART THREE ROLL ROTARY STRAIGHTENING MACHINE



MANUFACTURING ENGINEERS OF COMPLETE TRANSMISSION EQUIPMENT AND SPECIALIZED MACHINERY

MEDART

THE MEDART COMPANY

Build New Melt Shop in Chicago

Chicago—Construction of a new melt shop with an annual capacity of 53,000 tons of carbon and alloy steel forging ingots has been undertaken by A. Finkl & Sons Co. The new plant, to include two 20-ton electric furnaces, has been made necessary by increased freight rates and elimination of the basing point system, company officials state.

New facilities will adjoin the company's plant No. 1, acquired from Tarrant Foundry Co. recently. Completion is scheduled for March 1951

Cleveland Graphite Reports

Cleveland—Cleveland Graphite Bronze Co. reported net profit of $3,052,394 for 9 months of 1950 compared with $2,164,933 for the same period in 1949. Third quarter 1950 profit was $1,228,474 against $543,485 for the same period last year.

A 32,000 sq ft addition to the main Cleveland plant is being constructed for expansion of aircraft engine bearing production, according to the company report.

Baldwin Locomotive Net Dips

Philadelphia—Net profit of $1,977,472 for the first 9 months of 1950 has been reported by Baldwin Locomotive Works. This compares with a net of $2,297,098 for the comparable period in 1949. The 1950 figure includes $365,150 non-recurring profit on sale of an investment. Unfilled orders as of Sept. 30, totaled $73,592,475 compared with $57,563,141 at the same time last year.

"Human Engineering" Handbook

Washington—Dwelling on the design of mechanical equipment on the basis of detailed studies of human capabilities, a new handbook, "Human Engineering," has been published by the Office of Technical Services, U.S. Dept of Commerce. It was written by the Tufts College Institute for Applied Experimental Psychology.

THE installation of a Wean-Hallden Synchronized Automatic Shear Line assures you the most efficient shearing operation available today. The Wean-Hallden, while actually requiring *less floor space*, delivers up to *twice the production*.

Infinite variable lengths from 12-inches to 12-feet at speeds up to 200 FPM with accuracy better than commercial tolerances means faster production, reduced labor costs and minimum scrap loss for you. *Before You Buy—Investigate Wean-Hallden.*

If you are in the business of handling strip steel or fabricating steel parts or products from strip steel you should give your slitting operation high consideration.

Well designed slitting lines enable you to reduce inventories, lower labor costs and eliminate expensive extras. Wean engineered slitting lines give you these important factors at lowest initial costs.

If you have a slitting problem — or merely desire a check on the efficiency of your present operation — call in Wean specialists.

Wean *Equipment Corporation*
CLEVELAND, OHIO

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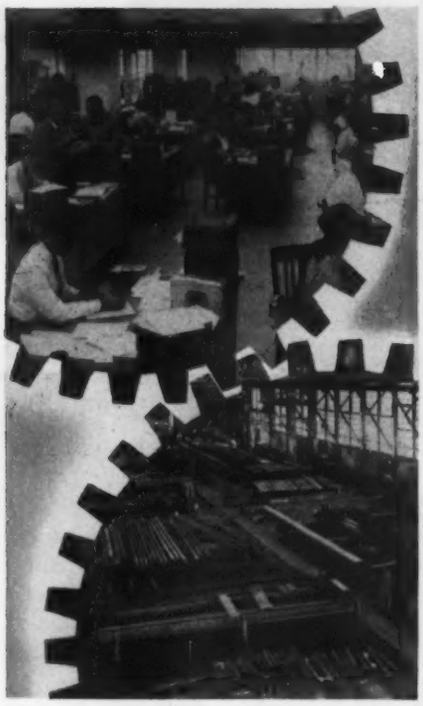

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TO TODAY'S CONDITIONS

Once again the Nation is confronted with an almost war-time emergency. Once again metals are difficult to procure. Here at Levinson our entire organization has already been geared to meet today's new problems. Conditions may have changed but Levinson's policy of close customer cooperation never changes. *This means . . .*

1. We will use every means at our command to try to supply our customers, even on a limited basis.
2. We will spare no effort to help you work out any of your problems in connection with the economical use of metals.
3. We will never deviate from our long established policy of never charging a premium for anything—*regardless of conditions.*

LSS-7

Levinson

STEEL SALES CO.

20TH AND WHARTON-STS., S. S.
PITTSBURGH, PA.

Warehouse Aluminum & Steel Products

Ford Steel Shows Large Increase

Detroit—Increased steelmaking capacity at Ford Motor Co. highlights the postwar growth of capacity. Estimated 1950 blast furnace output will reach 1,068,000 tons as compared with an average output of 421,680 tons during 1940-45. Electric furnace production multiplied five times and 1950 production will be 158,000 tons. Openhearth ingot production for 1950 is expected to reach 1,233,000 tons.

Toledo Unit Installs Officers

Toledo, Ohio—James M. Leake, of the Leake Stamping Co., Monroe, Mich., was installed as chairman of the Toledo District of the Pressed Metal Institute, and George Lober, Superior Spinning and Stamping Co., vice-chairman. John McCurrey, managing director of the Northwestern Ohio Industrial Council, spoke on the menace of subversive activity at the group's recent meeting.

Dravo to Build Steel Coal Barges

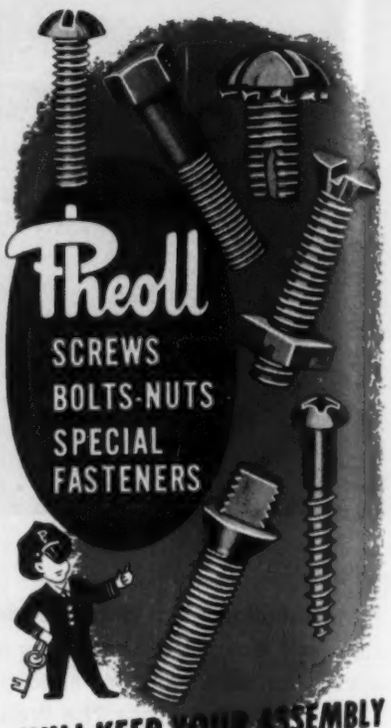
Pittsburgh—Dravo Corp. will build 10 new welded steel coal barges for Pittsburgh Consolidation Coal Co. The hopper barges, 175 feet long by 26 feet wide, will be used to transport coal on the Monongahela River. Dravo also is constructing two new twin-screw towboats for the coal company's river fleet.

Gaston Interests Change Hands

Harvey, Ill.—Sale of Gaston Power Tools to Gaston Power Tools, Inc., has been announced by Ralph M. Gaston. The new firm will carry on production of the Gaston line of polishers, grinders, generators and concrete vibrators.

Yale & Towne Reports Earnings

New York—Net earnings of $582,327 for the 3 months ended Sept. 30 has been reported by Yale & Towne Mfg. Co. Earnings for 9 months of 1950 were $1,568,323 compared with $483,685 for a similar period in 1949.



WILL KEEP YOUR ASSEMBLY LINES AT PEAK CAPACITY

Whatever you manufacture or assemble, you can speed production and improve your product by using Pheoll screws, bolts and nuts. These industrial fasteners drive easy and straight, and will not bind because threads are accurately rolled or machined. Precision-made screw and bolt heads, slots and head recesses prevent wrench and driver slippage. Count, too, the added bonus you receive by using fasteners that improve product appearance.

An interesting story on standard and special industrial fasteners and their profitable applications to your needs may be obtained from experienced Pheoll engineers. Ask these men to recommend screws, bolts and nuts that will increase your overall profits on assembly line work.

these Pheoll products prevent production lag

Tapping Screws • Cap Screws • Sems • Phillips Recessed Head Screws and Bolts • Machine Screws • Special Fasteners • Thread Cutting Screws

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Draw with confidence on this winning pair. Call either warehouse for prompt, dependable service on . . .

COLD FINISHED BARS — Rounds, Flats, Squares, Hexagons.

STRIP — Cold Rolled, Hot Rolled, Pickled. Coils and Cut Lengths.

SPRING STEEL — Tempered, Annealed.

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TUBING — Seamless and Welded, Carbon and Alloy.

TIN MILL PRODUCTS — Black Plate, Tin Plate.

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DRILL ROD • FLAT WIRE • SHANK STEEL • SHIM STEEL • SILVER BRAZING ALLOYS AND FLUXES

Complete Facilities for Cutting, Sawing, Shearing and Slitting.
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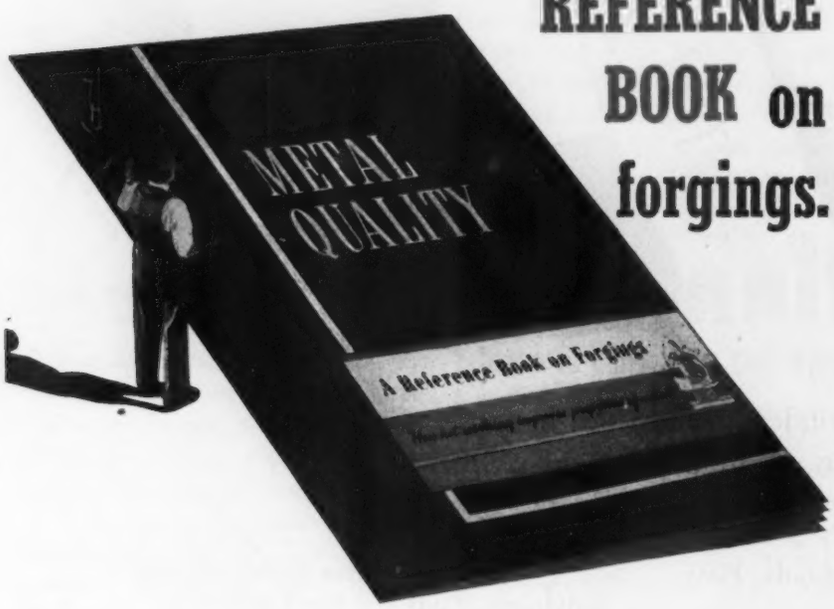
What *Forgings* have that offer so many more economic, engineering and production advantages than can be obtained with any other material, is illustrated and described in this REFERENCE BOOK on forgings.



Write for a copy. Then consult a forging engineer about how you can obtain the correct combination of mechanical qualities in forgings for your particular type of equipment.

DROP FORGING ASSOCIATION
605 HANNA BUILDING
CLEVELAND 15, OHIO

Please send 60-page booklet entitled "Metal Quality—How Hot Working Improves Properties of Metal", 1949 Edition.

Name.....

Position.....

Company.....

Address.....

Chase to Open Birmingham Plant

Birmingham — Chase Aircraft Co., this city, will manufacture the new Air Force XC-123 and YC-122C transport assault planes. Chase has leased six of the big bays of the old Bechtol-McCone modification center for B-29s and will move the entire equipment and material from the Chase plant at Trenton, N. J.

Michael Stroukoff, president, said that the plant is not a temporary war project and will manufacture civilian planes after government contracts are completed. About 9000 will be employed when full operation begins in 1951.

Western Metal Groups Plan Show

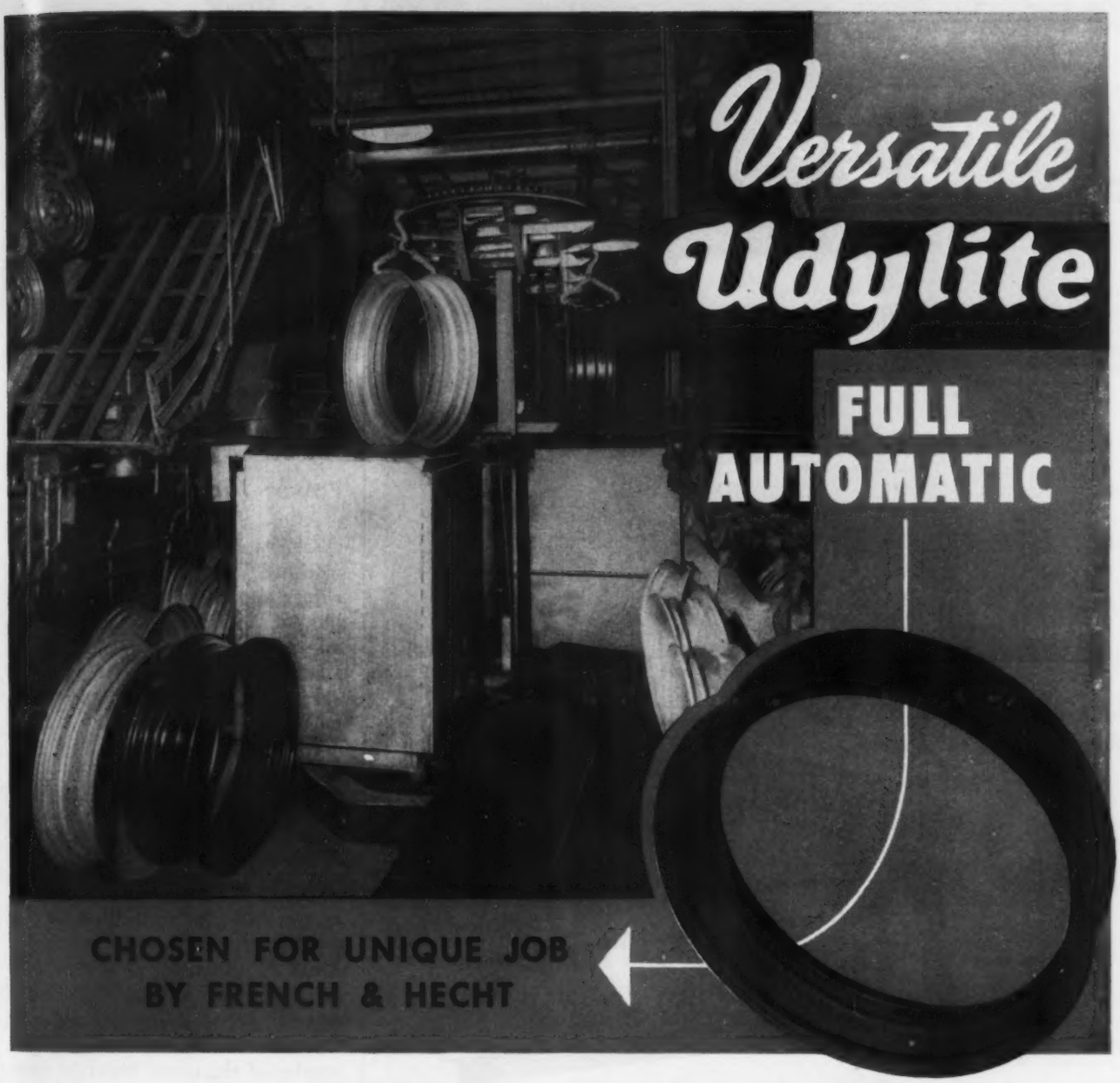
Oakland, Calif. — "Production for America" will be the theme of the Seventh Western Metal Exposition to be held March 19 through 23, 1951, in Oakland's Auditorium and Exposition Hall. Some 100 speakers will also deliver papers on metal fabricating problems at technical sessions of the Western Metal Congress, to be held simultaneously in Oakland, according to announcement by William H. Eisenman, secretary of the American Society for Metals.

Americans Build More Quickly

London—Two British productivity teams returned from an American tour of the electricity supply industry agreed that Americans can build power stations in little over half the time taken in England. They reported that competition among plant manufacturers in England was almost non-existent. In America a boiler takes 24 months from order to service and in Britain, 48 months, they said.

Asks FPC Pipeline Approval

Washington—The New River Gas Co., of Radford, Va., has applied to the Federal Power Commission for authority to build 50 miles of additional gas transmission line in southwest Virginia. The cost is estimated at $700,000.



Plating huge tractor wheel rims is quite an assignment for a standard model full automatic machine. But French & Hecht Division of Kelsey-Hayes Wheel Company reports splendid results with their Udylite equipment. This unique installation is just one example of the many varied applications of standard Udylite Full Automatics. They're being used to plate everything from cuff links to Diesel engine parts—in every type of finish—with every type of process.

The chances are that Udylite equipment is just what *you* need to answer *your* plating problem. Why not call in your nearby Udylite Technical Man today and let him tell you what Udylite equipment can do? Like many other companies, you may find the Udylite way the sure way to greater profit and lower per-unit cost in any metal finishing operation. Or write direct to The Udylite Corporation, Detroit 11, Michigan, for complete information. There's no obligation.

PIONEER OF A BETTER WAY IN PLATING

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

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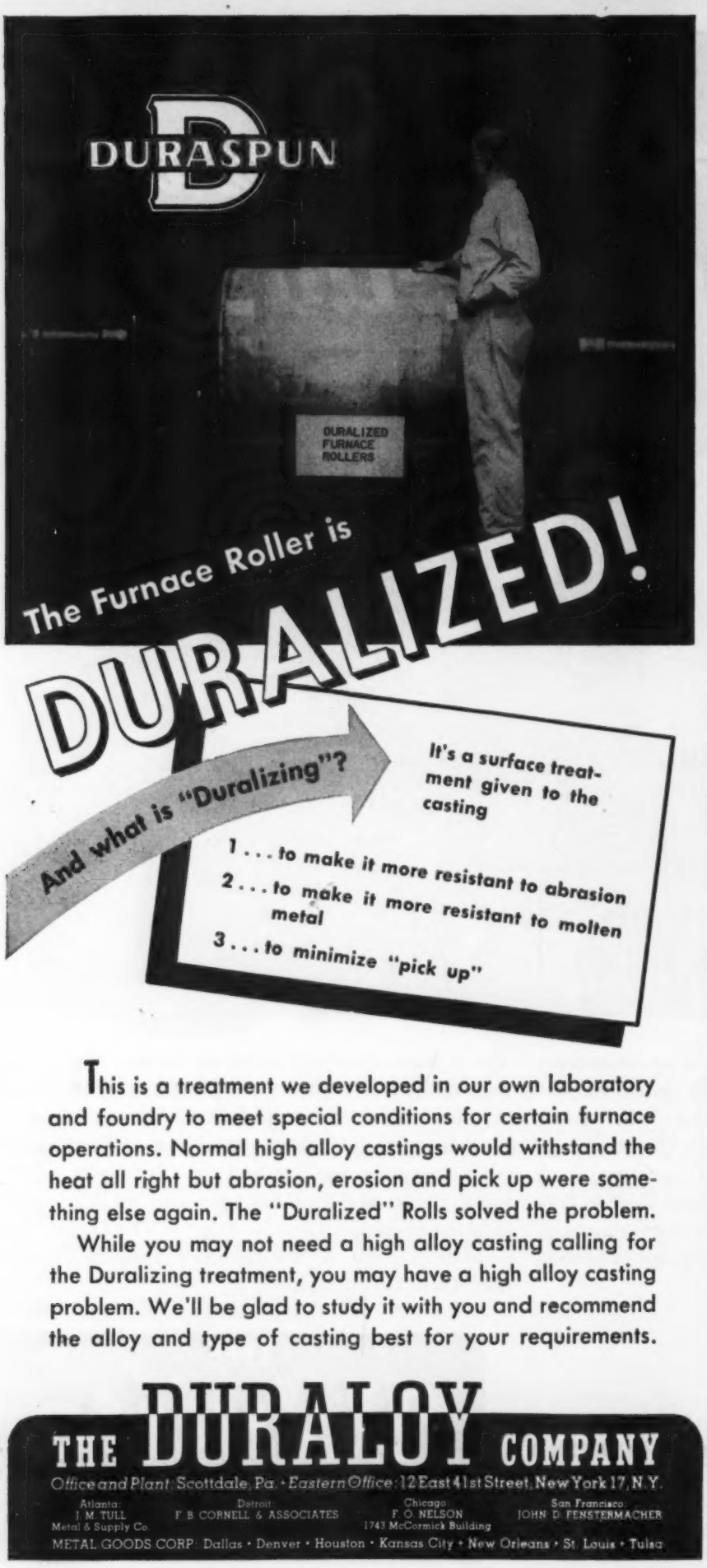
DURASPUN
DURALIZED FURNACE ROLLERS
The Furnace Roller is
DURALIZED!
And what is "Duralizing"?
It's a surface treatment given to the casting
1 . . . to make it more resistant to abrasion
2 . . . to make it more resistant to molten metal
3 . . . to minimize "pick up"

This is a treatment we developed in our own laboratory and foundry to meet special conditions for certain furnace operations. Normal high alloy castings would withstand the heat all right but abrasion, erosion and pick up were something else again. The "Duralized" Rolls solved the problem.

While you may not need a high alloy casting calling for the Duralizing treatment, you may have a high alloy casting problem. We'll be glad to study it with you and recommend the alloy and type of casting best for your requirements.

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PUBLICATIONS

Continued from Page 34

to transformers, circuit breakers, transmission towers and structural steel is given. Spreading rate, drying time and methods of application are specified for each type of coating. Waterproofing and concrete sealing coatings, their application and advantages are also discussed. *James B. Sipe & Co.*

For free copy insert No. 7 on postcard, p. 35.

Power Tool Catalog

A new 60-p. catalog pictures and describes Delta-Milwaukee metalworking and woodworking machines and other tools in the broad line of 53 machines, 246 models, and more than 1300 accessories. Detailed information on product specifications, prices, motor recommendations, and accessory listings is included. *Delta Power Tool Div., Rockwell Mfg. Co.*

For free copy insert No. 8 on postcard, p. 35.

Bending Principle Shown

The Pines principle of bending, designed for finger tip control of tremendous power directed to swiftly produce widely diversified bends, is explained in a new 20-p. booklet. Various models of tube and rod bending and end finishing machines are shown, along with examples of the many types of bends these units can perform. Capacities are listed and the basic principles of bending practices are discussed. *Pines Engineering Co., Inc.*

For free copy insert No. 9 on postcard, p. 35.

Authorized Shops Listed

How to obtain prompt service on Reliance drives, motors and electronic controls is explained in a new 4-p. bulletin containing up-to-the-minute information on the company's authorized service shops. Eighty-three service shops located in 31 states in all parts of the country are listed in the folder, which also gives the complete address, telephone number and name of the man in charge of each shop. *Reliance Electric & Engineering Co.*

For free copy insert No. 10 on postcard, p. 35.

Resume Your Reading on Page 35

The right HEAD— The right THREAD for your PRODUCTION LINE!

LAMSON TAPPING SCREWS

FOR THE SPECIFYING ENGINEER

HEADS

ROUND HEAD

PAN HEAD

TRUSS HEAD

HEX HEAD

BINDING HEAD

THREADS

Type "A" thread is pointed for quick, clean starts in small drilled, clean-punched or pierced holes in lighter gauge metals.

"A"

Type "B" is the "dog" pointed type for use in heavier materials.

"B"

Type "C" thread is also available in the above heads.

- Design and production engineers realize the extreme importance of intelligent fastener selection. It is of primary interest to the designer, for instance, that fasteners have the holding power and durability to withstand strains and stresses imposed upon them. The production man insists upon quick-assembling fasteners with high torque strength. Fumbling and material waste cannot be tolerated.

Lamson & Sessions Tapping Screws offer a happy combination of these "musts"—plus a wide selection of heads with slots or recesses in carbon or stainless steels. All heads are available with "A", "B", or "C" type threads.

Make Lamson your headquarters for Tapping Screws, and be assured of trouble-free uniformity from a dependable source of supply.

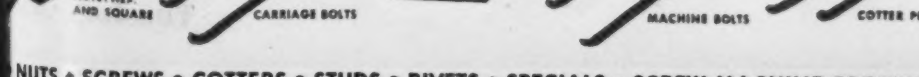
The LAMSON & SESSIONS Co.

General Offices: 1971 West 85th Street, Cleveland 2, Ohio

Plants at Cleveland and Kent, Ohio • Birmingham • Chicago

MAKERS OF FINE

FASTENERS SINCE 1866



NUTS • SCREWS • COTTERS • STUDS • RIVETS • SPECIALS • SCREW MACHINE PRODUCTS

CUT ALONG THIS LINE

MONEY-SAVER FASTENERS *Pay Dividends*

LAMSON LOCK NUTS: Economical, vibration-proof. Can be re-used repeatedly.

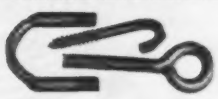
"1035" SET SCREWS: Cup point type, hardened, heat-treated.

COTTER PINS: Steel, Brass, Aluminum and Stainless Steel.

SPECIAL NUTS: Cone, Barrel, Oblong, Plier, Tri-Slot, Half-round, etc.

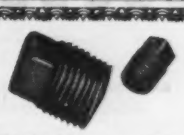
PHILLIPS AND CLUTCH HEAD: Machine Screws and Tapping Screws.

MILLED STUDS: Concentric, accurate, in a full range of sizes.



"BENT" BOLTS: Including U Bolts, Eye Bolts, Hook Bolts, etc.

WEATHER-TIGHT BOLTS: Eliminate counter-boring in wood assemblies.



PIPE PLUGS: Forged Steel, heat-treated.

FOR MORE INFORMATION ON LAMSON *Money-Saver* FASTENERS . . . . . CHECK COUPON and CLIP THIS STRIP

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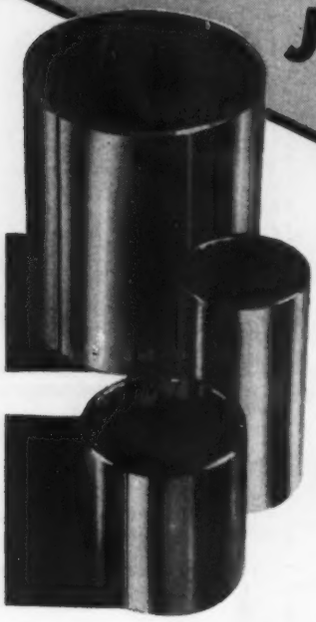
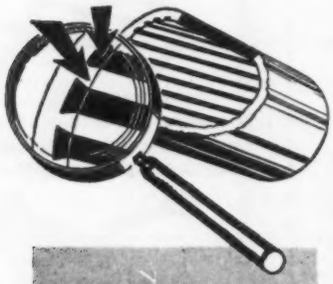
On hard-to-lubricate applications SPECIFY · · JOHNSON GRAPHITED BEARINGS



YOU can eliminate bearing troubles on applications where lubrication is difficult or liable to be neglected. Johnson Graphited Bearings are designed for 40 to 45% graphite contact with the shaft, thus supplying constant free-running without further lubrication. In addition, Johnson Graphited Bearings are highly desirable where ordinary lubricants may damage food, textiles and other goods in process. They are widely used on conveyor rolls, immersion rolls in textile and paper industries, pumps handling corrosive liquids, and many other heavy-duty applications. Johnson Graphited Bearings are manufactured in cast bronze and sheet bronze. They are available in serrated and in plug types as illustrated. If you have such a troublesome bearing problem, write, wire or call for further information.

BRONZE
GRAPHITE



Graphite held permanently in place. Graphite area increases with wear. Not soluble in gasoline, oil or water.

●

SELF LUBRICATING LEDALOYL bearings, produced by powder metallurgy, are widely used for hard-to-lubricate applications where heavy-duty service is not an important factor. Johnson Bronze engineers will be glad to advise which type, Ledaloyl or Graphited, will best fit your requirements.

Johnson Bronze
SLEEVE BEARING HEADQUARTERS
505 SOUTH MILL STREET • NEW CASTLE, PA.

NEW

PRODUCTION IDEAS

Continued from Page 38

from small rods to 5/8 in. diam bars and ten holes are provided in the cutting head ranging from 1/16 to 5/8 in. in steps of 1/16 in. An

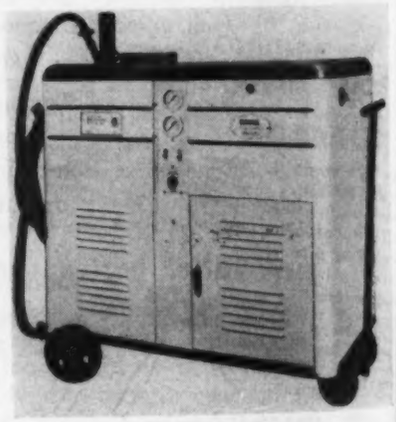
Ejectomatic gage provides separate operations of gaging, parting and ejecting in a single working cycle. *O'Neil-Irwin Mfg. Co.*

For more data insert No. 25 on postcard, p. 31.

Vapor Steam Cleaner

Fully automatic, safety protected system enables one-man operation.

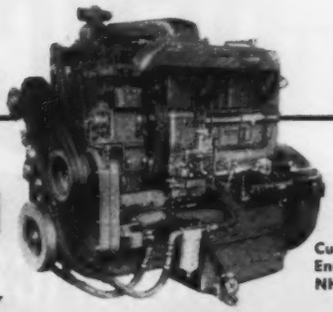
At the snap of a switch a spark is generated that ignites the burner and puts the new heavy duty vapor steam cleaning machine in action. From this point on, automatic controls maintain the operation at its



peak. Full operating pressure is claimed to be generated within 90 sec. The entire system is automatically protected from excessive pressures at three independent points. No pre-mixing of the cleaning compound is necessary. The mixing operation is automatic, the required amount of hot water being fed into the compound tank to in-

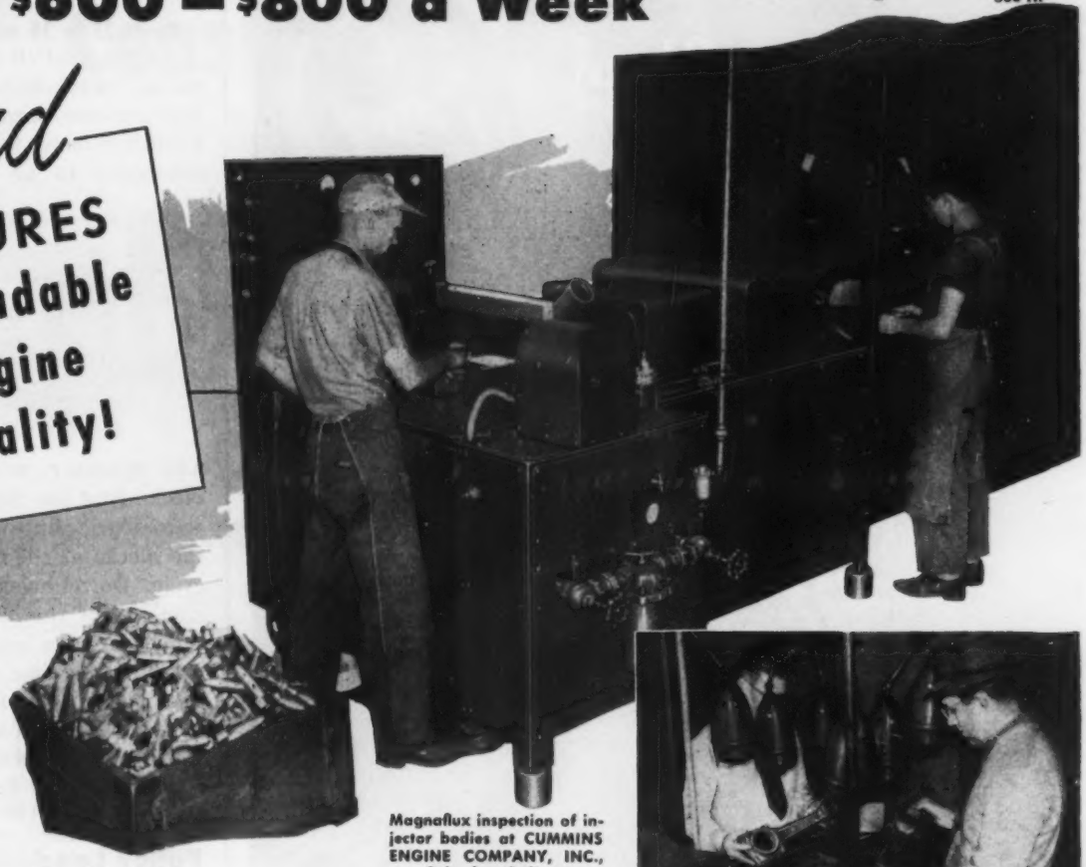
At Cummins Engine Company

MAGNAFLUX* INSPECTION SAVES $600 — $800 a Week



Cummins Diesel Engine — Model NHRBS — 600 — 300 HP

and INSURES dependable engine quality!



Magnaflux inspection of injector bodies at CUMMINS ENGINE COMPANY, INC., Columbus, Indiana

Inspecting rough forged connecting rods for Magnaglo fluorescent indications under black light.

Cummins Engine Company Diesels are recognized for dependable service in the field. This they insure in manufacture by fully effective Magnaflux-Magnaglo* inspection of critical parts.

By using Magnaglo to detect defective forgings and castings *in the rough*, Cummins Engine Company eliminates useless finishing operations. Direct savings in machining time, equipment and labor are currently averaging $600 to $800 a week—with production capacity increased in similar ratio.

Forgings and castings to be inspected are hand-loaded onto the Magnaflux unit's endless conveyor and automatically processed with Magnaglo. At the inspection station pertinent defects are indicated under the black light by glowing fluorescent lines. Depending upon the kind of parts in process, up to 1200 pieces per hour can be inspected.

Cummins' operation may not be typical of your problem but Magnaflux has solutions for most industries. Invite an experienced Magnaflux engineer to discuss them with you.

** Magnaflux and Magnaglo are U. S. registered trademarks of Magnaflux Corporation*

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Reg. U. S. Pat. Off.

MAGNAFLUX CORPORATION

5902 Northwest Highway, Chicago 31, Illinois

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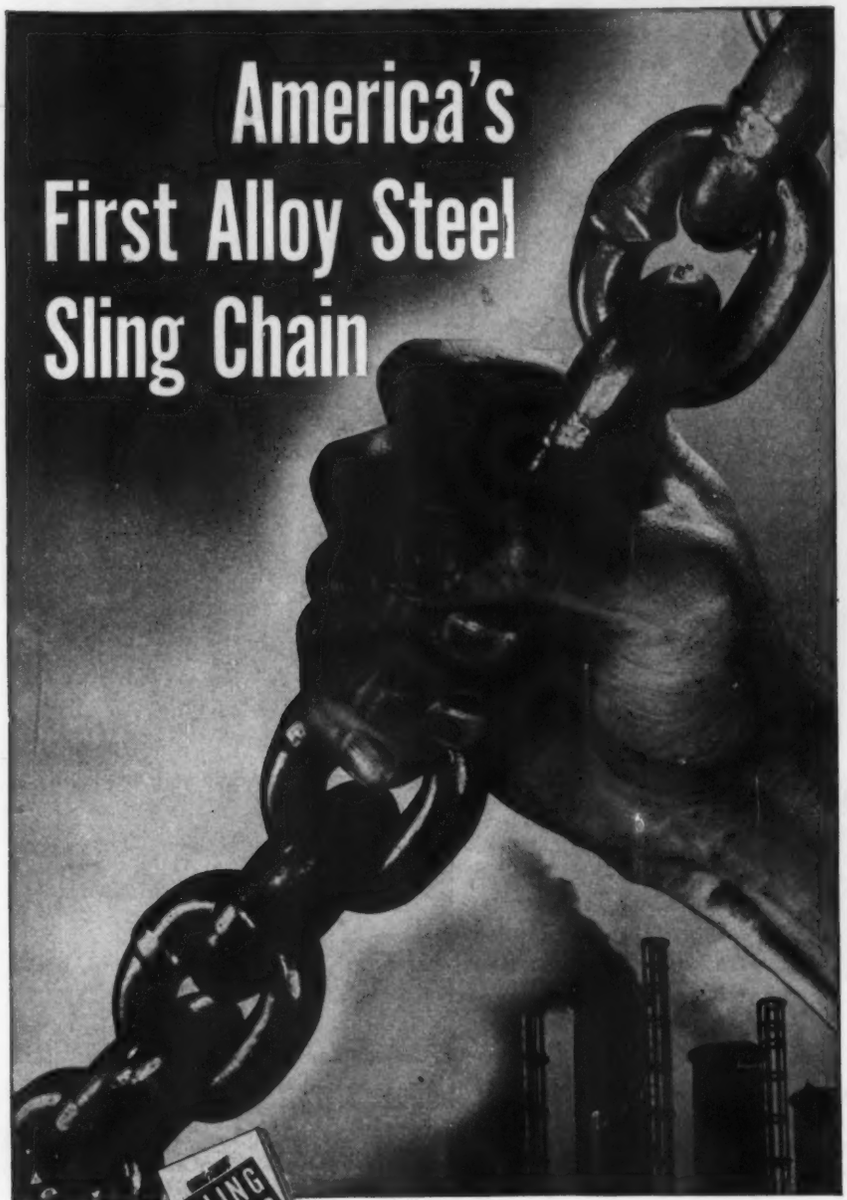
Export Distributor: Curtis Wright Corp. *In Canada:* Williams & Wilson, Ltd.

CM HERC-ALLOY

America's First Alloy Steel Sling Chain



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COLUMBUS-McKINNON
CHAIN CORPORATION
(Affiliated with Chisholm-Moore Hoist Corporation)
GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.
SALES OFFICES: NEW YORK, CHICAGO, CLEVELAND AND SAN FRANCISCO

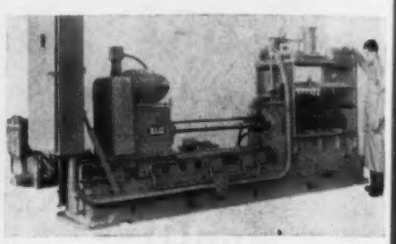
sure proper dissolving. Stationary or portable models of 100 or 200-gal capacities are available, with various alternate attachments. *General Equipment Div., Sterod Mfg. Co.*

For more data insert No. 26 on postcard, p. 35.

Line Boring Machine

Bores 25 to 35 engine blocks per hr.

On the Ex-Cell-O line boring machine, crankshaft and camshaft bearings can be precision line bored simultaneously to extremely close tolerances in an automatic cycle.



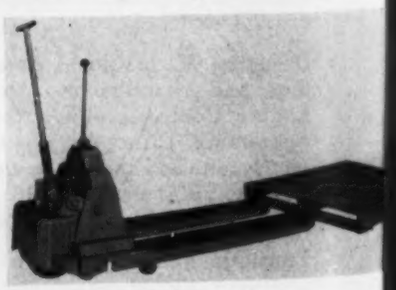
The operator merely pushes the blocks into the fixture, presses the start cycle button, then removes the blocks at the completion of the cycle. Dowel holes in the transmission end of the block and distributor shaft holes are sometimes done at the same time on the same machine. The tools for the respective bores are held in solid boring bars, rigidly supported for accurate bearing alignment. *Ex-Cell-O Corp.*

For more data insert No. 27 on postcard, p. 35.

Pallet Load-Lift

Aluminum alloy pallet lift truck has automatically retractable wheels.

When the forks of this aluminum pallet lift truck are in a lowered position, the special wheels auto-



matically retract. The truck, supported on two front wheels and two auxiliary wheels on a very short wheel base, turns around "on a dime." The rear wheels are 1 in. above the floor and enter and leave the pallet without interference of

Now TWA Offers All-Cargo "Sky Merchant" Service Coast to Coast

Speed your industrial-product shipments direct at low cost between major U. S. cities

Practically anything you want to ship . . . and to almost anywhere you want to ship it . . . can now go faster, more economically and more easily via TWA's new fleet of giant, 4-engine *All-Cargo* planes . . . TWA "Sky Merchants."

TWA's "Sky Merchants" offer a new daily service to and from the principal commercial and industrial markets throughout the U.S. Direct flights, with connections serving more than 60 cities. Fast, daily service coast to coast . . . overnight between most points.

TWA's new *All-Cargo* "Sky Merchant" fleet greatly expands TWA's air freight service . . . already widely used by experienced shippers throughout the world. This dependable service with its increased facilities enables you to save transit time . . . save money . . . save work . . . beat competition . . . meet deadlines . . . increase turnover . . . increase sales.

Remember—it's good business today (and every day) to speed your large or small shipments via TWA. Phone nearest office for prompt pickup . . . rates . . . information. Write today for free Air Freight folder. Address: Cargo Sales Manager, TWA, 60 East 42nd Street, New York 17, N.Y.

TYPICAL LOW TWA AIR CARGO RATES	FROM	TO	COMMODITY	RATE PER 100 LBS. (MINIMUM WEIGHT)
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	Chicago	Los Angeles	Metal Products (O/T iron & steel)	19.25
	Indianapolis	Pittsburgh	Hardware & Tools	4.46
	New York (Newark)	Los Angeles	Plastic Products	27.50
	Dayton	New York (Newark)	Machines & Machine Parts	4.67

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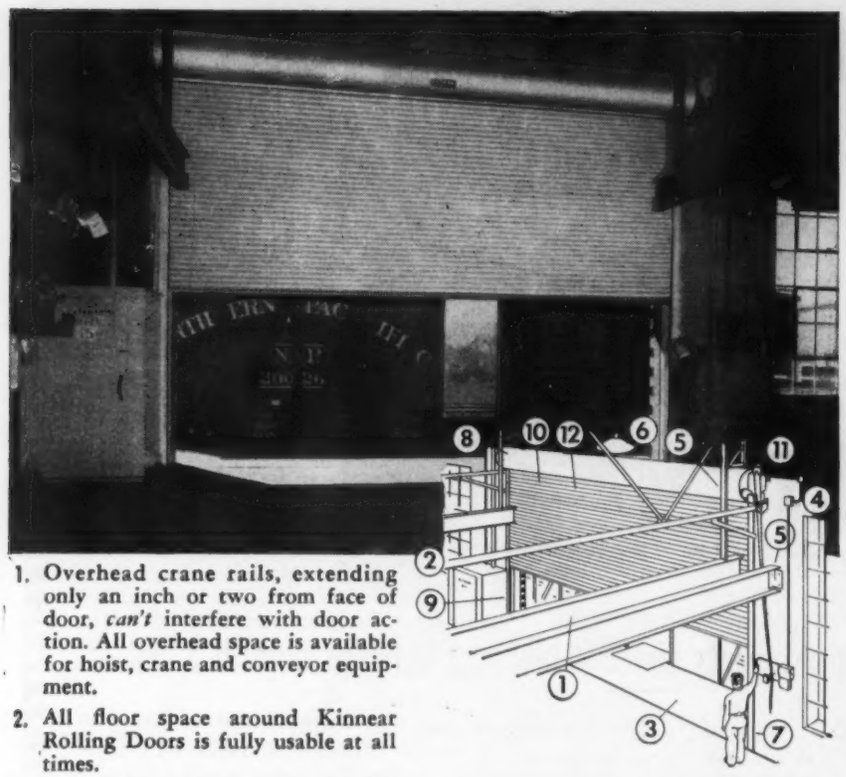
No other doors offer all these advantages



1. Overhead crane rails, extending only an inch or two from face of door, *can't* interfere with door action. All overhead space is available for hoist, crane and conveyor equipment.
2. All floor space around Kinnear Rolling Doors is fully usable at all times.
3. No sacrifice of space on narrow loading platforms with Kinnear Rolling Doors. They need no room inside or outside the building for opening and closing action.
4. Windows can be placed right next to Kinnear Rolling Doors . . . they are never blocked off when the doors are operated.
5. Supports or other superstructure can be placed close to sides, front and top of Kinnear Rolling Doors —inside or outside the building.
6. Light from overhead fixtures is never blocked off by Kinnear Rolling Doors, they coil compactly above the opening.
7. Wind can't blow Kinnear Doors back and forth, or damage them. Edges are anchored in steel tracks from floor to ceiling!
8. Kinnear Rolling Doors open straight upward, coiling completely out of the way of traffic, safe from damage.
9. The opening is cleared from jamb to jamb and floor to lintel. No projecting edges or parts to obstruct opening.
10. A continuous curtain of strong interlocking steel slats gives you extra protection against fire, theft, intrusion, wind, weather and accidental damage.
11. Kinnear smooth, upward action is ideal for time-saving motor operation, with convenient remote control. Rugged Kinnear motor operators do the trick.
12. Kinnear's interlocking steel slat curtain is not only more rugged and longer lasting, but permits any number of slats to be individually replaced if accidentally damaged. Lower maintenance costs!

You get many other advantages in addition to those highlighted above in Kinnear Rolling Doors. They are built any size, with motor or manual operation. Easily installed in old or new buildings. Write for complete information or recommendations

THE KINNEAR MANUFACTURING CO.
Factories: 1760-80 Fields Ave., Columbus 16, Ohio
1742 Yosemite Ave., San Francisco 24, California
Offices and Agents in All Principal Cities

Saving Ways in Doorways
KINNEAR ROLLING DOORS

Kinnear Rolling Doors

damage to the bottom boards. Operating the lifting handle automatically brings rear load wheels down to the floor and raises auxiliary wheels. *Market Forge Co.*

For more data insert No. 28 on postcard, p. 35.

Work Glove Reconditioning

Service renovates, sanitizes, and packages fabric and leather gloves.

A new work glove reconditioning service, designed for all industries and occupations, includes complete

renovation, sanitizing and packaging of all types of worn-out fabric and leather gloves and protective clothing. Reconditioning costs only a fraction of new glove costs. Many gloves can be salvaged several times. A free trial plan is available. *U. S. Industrial Glove Corp.*

For more data insert No. 29 on postcard, p. 35.

Band Dispenser

Speeds applications of cut-to-length ¾, 1½, 2-in. strapping.

Stationary and portable models of a new dispenser hold and cut

to length one or two coils of Unit-Load Band, used to reinforce shipping containers, and brace carload

Call STERLING BOLT FOR Machine Bolts

all sizes
Hexagon Head
Square Head
Steel or
Brass

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Whether you need machine bolts or any of the hundreds of other items in our full line of metal fastenings, the quickest, easiest, most efficient way for you to fill your requirements is to call Sterling Bolt. • It is to your advantage to use "Sterling Bolt One-Source Service" by listing *all your metal fastening needs* on one order. The benefits of One-Source Service are cumulative—convenience and efficiency in ordering, savings resulting from reduction in personnel time and paper work, and security in the knowledge that the right fastenings will be delivered to the right place at the right time. Whatever your metal fastening needs . . .

phone, wire, teletype, or write Sterling Bolt!

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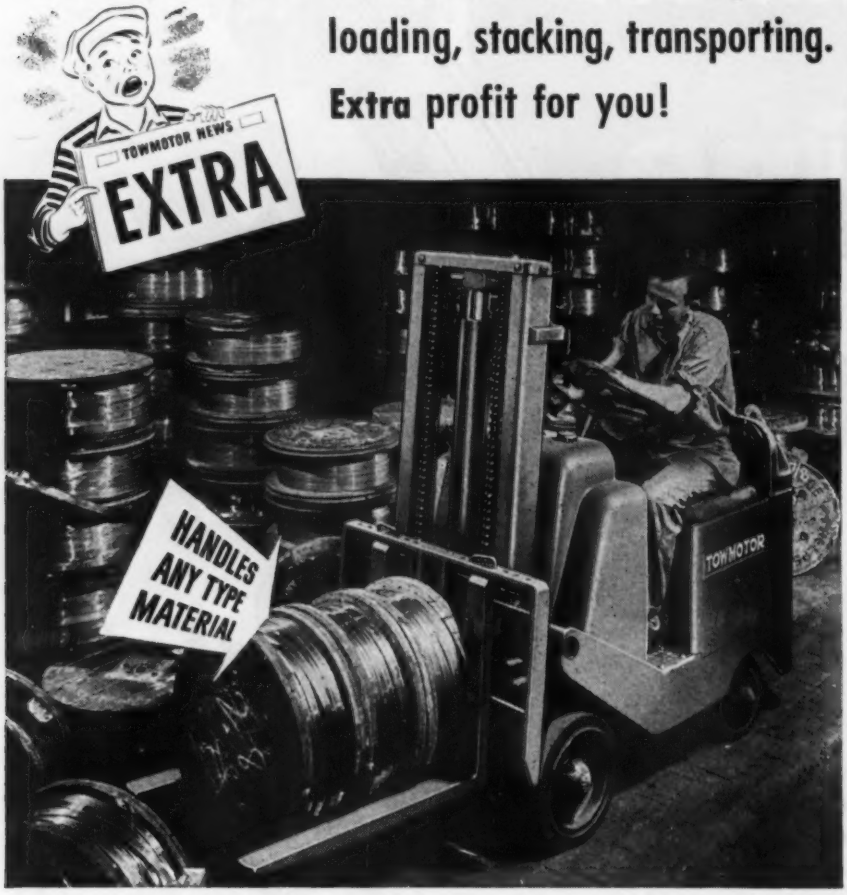
Extra help on toughest Mass Handling jobs.
Extra man-hours saved. Extra fast moving, loading, stacking, transporting.
Extra profit for you!



It will cost you nothing extra to learn how Towmotor *Mass Handling* makes every materials handling job easier, faster, safer. For complete information, write for your copy of "Handling Materials Illustrated." Towmotor Corporation, Division 15, 1226 E. 152nd St., Cleveland 10, Ohio. Representatives in all Principal Cities in U. S. and Canada.

THE ONE MAN GANG

Arrange now for a private showing of this 30-minute sound movie on Materials Handling. See how Towmotor effects startling reductions in production costs. Ask for complete details at no obligation.

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THE ONE-MAN-GANG ®

FORK LIFT TRUCKS and TRACTORS

RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

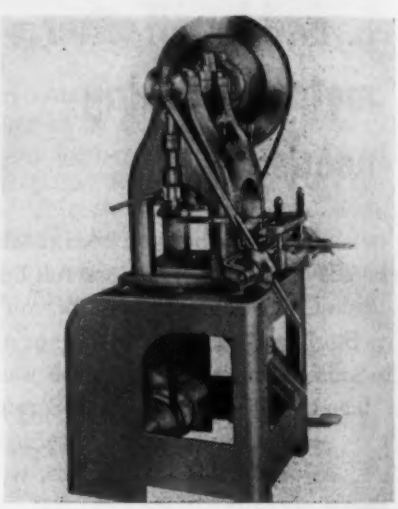
shipments. Bands are cut in a single downstroke of the hand lever. Any two-coil combination of ¾, 1¼ or 2-in. band in all thicknesses can be handled by the dispenser. *Acme Steel Co.*

For more data insert No. 30 on postcard, p. 35.

High Speed Press

Variable drive provides press speeds from 110 to 350 strokes per min.

Features of the new Diebel 8-ton press are a cylinder type ram which slides in an adjustable bronze sleeve for greater accuracy and longer life, and a rugged precision built-in roll feed, either single or double construction, which is easy to set and maintains a high degree of accuracy. Maximum standard die set capacity is 6 in. wide x 8 in. long, 6 in. shut height. *Di Machine Corp.*



For more data insert No. 31 on postcard, p. 35.

Water Demineralizer

Permanent cartridge requires only refilling with fresh resin charge.

A new ion exchange demineralizer for laboratories and other users of up to 10 gph of high purity, demineralized water has a permanent cartridge and is equipped with flow meter, a sight indicator that enable the operator to adjust flow intake to the proper rate for most efficient results. An electric conductivity meter built into the unit provides a continuous visual indication of the quality of the treated water, warning when the resin charge should be re-

SOMEONE IS INVESTING MONEY RIGHT NOW TO CUT MANUFACTURING COSTS

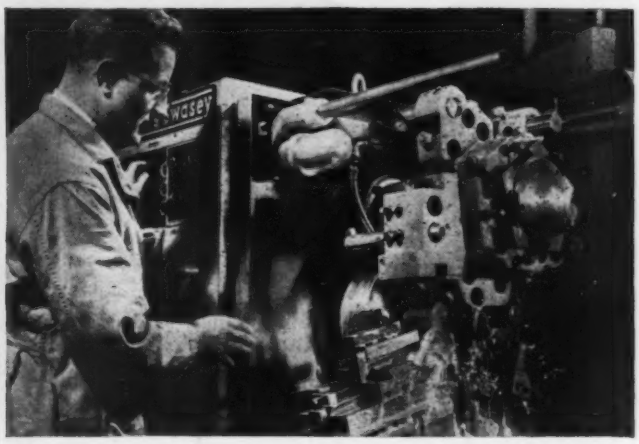
It may be your competitor!

When any one of your competitors invests in new machinery to increase output and cut his manufacturing costs, your profit outlook grows darker. Unless your production costs are at rock bottom he can undersell you, take orders away from you—and do it profitably!

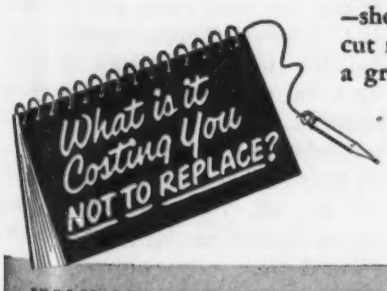
Don't invite lost orders by standing pat with old equipment. A replacement program for your shop can result in savings like those shown by actual experience in machine shops all over the country.

COMPANY A replaced two old turret lathes with *one* new Warner & Swasey No. 4 Universal. Output went up over 100%. Savings of over $3,400 a year were realized.

COMPANY B invested $130,000 in new Warner & Swasey 5-Spindle Automatics. Savings—$90,000 a year on the cost of the screw machine products the company uses.



COMPANY C invested in a new Warner & Swasey Single Spindle Automatic for the roughing of gear blanks. Production went up over 200%!

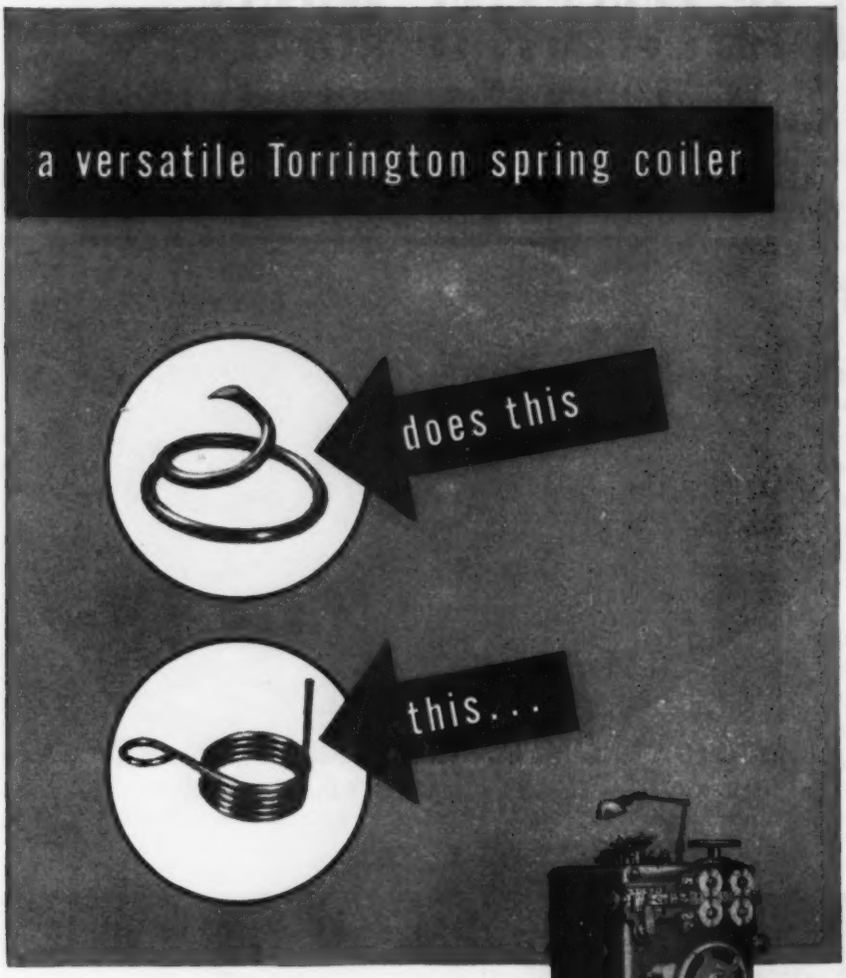


If you would like results like these, call in your nearest Warner & Swasey representative. He'll make a thorough, sound analysis—show you how, by replacing old machine tools, you can cut manufacturing costs . . . increase output . . . make a greater profit on your investment.

WARNER & SWASEY SELLS ONE THING . . . INCREASED PRODUCTION

WARNER & SWASEY Machine Tools *Cleveland*

TURRET LATHES, MULTIPLE AND SINGLE SPINDLE AUTOMATICS, PRECISION TAPPING AND THREADING MACHINES



AND a practically unlimited range of other intricate spring designs to meet exacting requirements. By all means, the professional springmaker who owns a Torrington spring coiler is the man to see for spring coiling that's accurate, speedy and economical. Our sales department will gladly help you find a source of supply for any special spring you require, or, if necessary, help your springmaker devise tooling to produce it.

This is W-11, one of fourteen versatile Torrington Spring Coilers.

SPECIFICATIONS

Wire Diameter Range: .015" to .072"

Wire Length per Spring: 0" to 42" (Extra Wire Feed Gears Available)

Coil Range (O.D.): 3/32" to 1-9/16"

Production: 23 to 190 springs per minute with variable speed drive

Torsion and other attachments available.

The TORRINGTON MANUFACTURING COMPANY TORRINGTON, CONNECTICUT

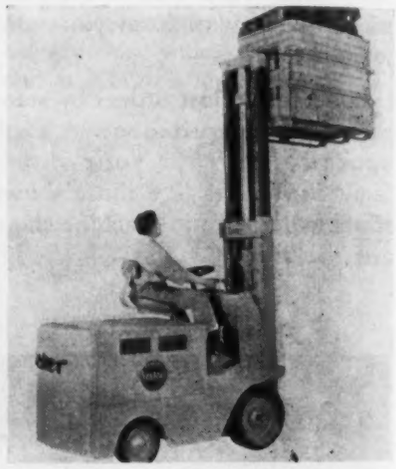
newed. No heat or steam power is required for operation of the demeralizer. *Penfield Mfg. Co., Inc.*

For more data insert No. 32 on postcard, p. 35.

Fork Trucks

Said to handle 5000-6000-lb loads safely, efficiently, economically.

This new truck finds application where ruggedness and low maintenance are of importance. The truck is 39¼ in. wide and has an outside turning radius of 79 in. Through the use of two sets of uprights, box car loading and high tiering operations are possible above the limits provided with 83 in. overall height. The lift and tilt mechanism is hydraulically operated. Direction is selected by manual control on the dash panel and speed is selected by a five-speed foot-operated accelerator. *Baker-Raulang Co.*



For more data insert No. 33 on postcard, p. 35.

Vibration Isolator

For all-around vibration control.

The Finnflex type 9 vibration isolator consists of a steel channel floated in rubber between two steel angles. The correct angularity between the steel parts and the rubber bonded thereto enables the isolator to approximate the flat spot in a stress-strain curve of relative slope. The isolator is available in any length up to 18 in., in four rubber stiffnesses for loads of 40, 50, 70, and 105 lb per in. of length at ¼ in. deflection. *Finn & Co.*

For more data insert No. 34 on postcard, p. 35.

Resume Your Reading on Page 39

MARKET

Briefs and Bulletins

strip mill plate extras — Size extras by Jones & Laughlin Steel Corp. on strip mill plate are $10 to $12 higher than similar extras charged by plate mills. This includes a $3 extra for sheared edge plates. Bulk of J. & L. plate production is for DO and government allocation programs. Quantity extras on orders of 10 tons or less range from $2 to $30. J. & L. warehouse prices excepting Chicago also reflect the changes, and in addition the company has revised warehouse flame cutting extras.

pinch is on—Material shortages are squeezing some steel fabricators and steel users in the Birmingham area breathless. They are keeping their fingers crossed in the hope of getting defense contracts with priority allocations.

split DO orders—Some mills are asking that large DO orders be split among two or more mills although the contractor can insist that one mill take his entire order provided the mill hasn't filled its DO quota on the product.

wire and fence prices— U. S. Steel Corp. has announced price changes on galvanized merchant wire, barbed wire and woven fence. Merchant wire, galvanized, is now quoted at $5.80 per 100 lbs. Worcester price is $6.10. Barbed wire base column is 130, and 150 at Pittsburg, Calif. Woven fence is quoted at base column 120, and 143 at Pittsburg, Calif.

pig iron—Four U. S. Steel subsidiaries have announced a $3 per gross ton increase in the price of various grades of pig iron effective Nov. 4. The companies concerned are Carnegie-Illinois, American Steel & Wire Co., National Tube Co., and Geneva Steel Co.

silvery iron boost— Hanna Furnace Co. raised its price on blast furnace silvery pig iron $2.50 to $60.75 per gross ton f.o.b. Buffalo, effective Nov. 1. This applies to 6.01 to 6.50 pct silicon pigs and the extra remains at $1.50 for each additional 0.50 pct silicon.

ferroalloys rise—Increases in prices averaging between 4½ pct to 6 pct on its major ferroalloy products were announced by the Vanadium Corp. Contracts and orders already booked will be completed at existing prices.

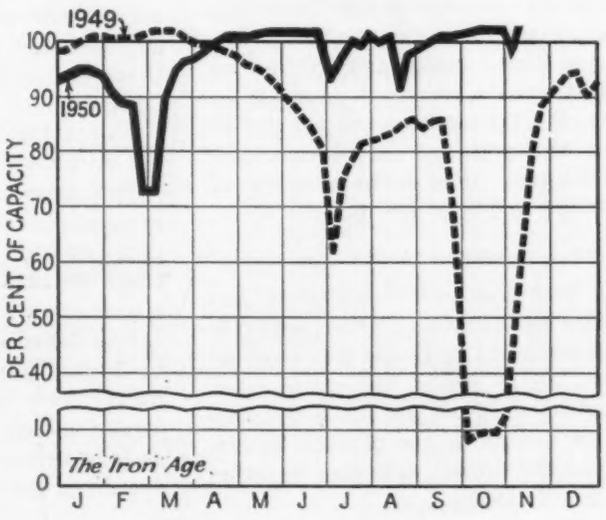
record shipments — October shipments from Inland Steel Co.'s Indiana Harbor Works, at E. Chicago, Ind., were 300,264 net tons including steel supplied by customers for conversion. It was a record for the month, exceeding by 19 pct the highest shipment figure attained during the peak of World War II operations.

cold-rolled spring steel— Due to rising costs, Blair Strip Steel Co. of New Castle, Pa., has announced increases in the prices of cold-rolled spring steel. They are: 0.26 to 0.40 carbon, $4.85; 0.41 to 0.60 carbon, $6.30; 0.61 to 0.80 carbon, $6.90; 0.81 to 1.06 carbon, $8.85.

cold-rolled strip—Detroit Steel Corp. increased the price of cold-rolled strip from $4.75 to $5.10 at Detroit and from $5 to $5.85 at New Haven effective Nov. 1. Prices on cold-rolled spring steel have also been raised.

turned and ground bars—Wyckoff Steel Co. has announced an increase in the price of turned, ground and finished bars of $5 to $10 per ton.

Steel Operations**



District Operating Rates—Per Cent of Capacity**

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	Birmingham	South	St. Louis	East	Aggregate
Oct. 29	101.0	105.0*	94.0	96.0	102.5	29.0*	97.5	106.0*	102.0	106.0	95.0	88.5	78.0	97.5*
Nov. 5	100.0	107.0	94.0	98.0	103.5	104.0	97.0	103.0	103.0	106.0	95.0	91.5	112.5	103:0

* Revised.
** Steel operations for the first half of 1950 are based on annual capacity of 99,392,800 net tons. Beginning July 1, 1950, operations are based on new annual capacity of 100,583,500 net tons.

Nonferrous Metals OUTLOOK

Market Activities

Brass and zronze ingots jump 1¾¢ to 6½¢ per lb; scrap costs blamed . . . NPA aluminum cutback modified to 25 pct, effective Jan. 1 . . . Producers object to stockpile timing.

New York—Secondary brass and bronze ingots have been boosted by 1¾¢ to 6½¢ per lb, a terrific jump. Main reason is the skyrocketing scrap market where prices have soared fantastically since the outbreak of hostilities in the Far East.

During the month of October, the price of Straits tin zoomed from $1.04 to $1.26, an increase of 22¢, and it has increased its rate of ascent since this month began. This also contributed to the ingot makers' increases.

The market for secondary aluminum is strong again this week, but there has not been a price increase as yet. That will probably happen within a week.

Copper scrap has also tightened somewhat since last week but dealers' buying prices have not changed for any of the metals except lead. Immediately following last week's 1¢ per lb increase in lead, a ¾¢ increase was registered in the price of soft scrap lead. The new price is in a range of 14¼¢ to 14¾¢ per lb.

NPA to Order 25 Pct Cut

The National Production Authority's aluminum order, which is expected to be issued this week as we go to press, has again been modified. Now the cut is to be 25 pct instead of the planned 35 pct, and the cutback date may be set as Jan. 1, 1950.

Fabricators are extremely unhappy about the whole thing and, in particular, they are complaining about the base period which has been set as the year from July 1, 1949, to June 30, 1950. Their objection is that during the first few months of the base period, fabricators' receipts of metal were only about 80 pct of normal.

This will mean an effective cut of up to 45 pct to some producers with the average hovering somewhere between 35 and 40 pct.

The reason given for this sizable curtailment in aluminum use is that the government plans to stockpile 200,000,000 lb of it during the first 6 months of next year. It is well known that industry has backed a stockpile plan since 1947. The Munitions Board finally agreed with industry about a year ago and only decided to stockpile the metal after the Korean war started.

As yet, the Munitions Board has not purchased any aluminum.

The aluminum industry is not opposed to stockpiling, but the idea was to stockpile metal at times of reduced demand, not at a peak such as now exists.

The Canadian offer of metal for U. S. stockpiling has expired. Industry here objected only to the 3-year nature of that offer and as long as the domestic producers are given the first crack at government orders they will be satisfied.

Another source of aluminum is the 160,000,000 lb of capacity belonging to Aluminum Co. of America which is now lying idle because it has only high-cost power available. Alcoa has agreed to split the difference on the premium necessitated by the expensive power.

Acceptance Would Help

While this would not cover the government's ambitious program, it would certainly be a great aid if this offer were accepted. Other aluminum producers in this country are already producing to the hilt despite the cost of power.

Notices have been sent by the General Services Administration indicating that the government will issue letters of intent to make 5-year contracts with domestic producers.

The idea here is to enable the producers to finance expansion against the intent of the government guaranteeing the purchase of 5-year output of the plant.

NONFERROUS METALS PRICES

	Nov. 1	Nov. 2	Nov. 3	Nov. 4	Nov. 6	Nov. 7
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake, delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.275	$1.32	$1.36	.....	$1.52	$1.52*
Zinc, East St. Louis	17.50	17.50	17.50	17.50	17.50	17.50
Lead, St. Louis	16.80	16.80	16.80	16.80	16.80	16.80

Note: Quotations are going prices.
*Tentative.

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 33.5¢; 52S, 35.6¢; 24S-O, 24S-OAL, 34.1¢; 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 32.9¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.

Plate: ¼ in. and heavier: 2S, 3S-F, 28.3¢; 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.

Extruded Solid Shapes: Shape factors 1 to 5, 36.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 26, 39.6¢ to $1.16; 36 to 38, 47.2¢ to $1.70.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢ to 38.5¢; cold-finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5¢ to 35¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32 in., 53.5¢ to 42¢; ⅜ to 1½ in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 39.5¢ to 29¢; 52S, 48¢ to 35¢; 56S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 75S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 63S-T5, OD in in.: 1¼ to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., $1.142; 96 in., $1.522; 120 in., $1.902; 144 in., $2.284. Gage 0.024 in. x 28 in., 72 in., $1.379; 96 in., $1.839; 120 in., $2.299; 144 in., $2.759. Coiled Sheet: 0.019 in. x 28 in., 23.2¢ per lb; 0.024 in. x 28 in., 26.9¢ per lb.

Magnesium

Does not reflect latest increase.

(F.o.b. mill, freight allowed)

Sheet and Plate: M-O, FS-O. ¼ in. 58¢ to 60¢; 3/16 in. 60¢ to 62¢; ⅛ in. 62¢ to 64¢; B & S gage 10, 63¢ to 65¢; 12, 67¢ to 69¢; 14, 73¢ to 78¢; 16, 80¢ to 85¢; 18, 88¢ to 93¢; 20, $1.00 to $1.05; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, FS, diam in., ¼ in. to 0.311, 66¢; ⅜ in. to ¾, 50¢; 1¼ to 1.749, 47¢; 2½ to 5 in., 45¢. Other alloys higher. Base: Up to ¾ in., diam, 10,000 lb; ⅞ in. to 1¾ in., 20,000 lb; 1¾ in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M, FS, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb, 3.5 in., 59.5¢; 0.22 to 0.25 lb, 5.9 in., 55¢; 0.50 to 0.59 lb, 8.6 in., 50.5¢; 1.8 to 2.59 lb, 19.5 in., 47.5¢; 4 to 6 lb, 28 in., 46.5¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ lb to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, FS, wall thickness, outside diam, in., 0.049 to 0.057, ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to 0.219, ⅝ to ¾, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 base, f.o.b. mill)

Commercially pure and alloy grades: Sheet and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	69	53
Strip, cold-rolled	75	56
Rods and bars	65	51
Angles, hot-rolled	65	51
Plates	67	52
Seamless tubes	98	86
Shot and blocks	..	46

Copper, Brass, Bronze

(Freight prepaid on 200 lb includes duty)

	Sheets	Rods	Extruded Shapes
Copper	41.68	....	41.28
Copper, h-r	....	36.78	....
Copper, drawn	....	38.78	....
Low brass	38.92	38.61	....
Yellow brass	38.28	37.97	....
Red brass	40.14	39.83	....
Naval brass	42.33	37.14	38.40
Leaded brass	....	32.63	36.70
Com'l bronze	41.13	40.82	....
Mang. bronze	45.96	40.65	41.41
Phos. bronze	60.20	60.45	....
Muntz metal	40.42	36.74	37.99
Ni silver, 10 pct	49.27	51.49	....
Arch. bronze	....	....	35.11

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	19.00
Aluminum pig	18.00
Antimony, American, Laredo, Tex.	32.00
Beryllium metal, 95%, lumps, beads	$95.00
Beryllium copper, 3.75-4.25% Be, dollars per lb contained Be	$30.00
Beryllium aluminum 5% Be, dollars per lb contained Be	$65.00
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.40
Cobalt, 97-99% (per lb)	$1.80 to $1.87
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$200
Lead, St. Louis	16.80
Lead, New York	17.00
Magnesium, 99.8+%, f.o.b. Freeport Tex., 10,000 lb	24.50
Magnesium, sticks, 100 to 500 lb	42.00 to 44.00
Mercury, dollars per 76-lb flask f.o.b. New York	$92.50 to $95.00
Nickel, electro, f.o.b. New York	51.22
Nickel oxide sinter, f.o.b. Copper Cliff, Ont., contained nickel	44.25
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	80.00
Tin, New York	$1.52
Titanium, sponge	$5.00
Zinc, East St. Louis	17.50
Zinc, New York	18.22
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	29.00
No. 120	28.50
No. 123	28.00
80-10-10 ingot	
No. 305	35.00
No. 315	32.00
88-10-2 ingot	
No. 210	47.50
No. 215	44.50
No. 245	37.00
Yellow ingot	
No. 405	25.50
Manganese bronze	
No. 421	32.75

Aluminum Ingot

(Cents per lb, 30,000 lb lots)

95-5 aluminum-silicon alloys	
0.30 copper, max.	32.75-33.25
0.60 copper, max.	32.50-33.00
Piston alloys (No. 122 type)	29.75-30.25
No. 12 alum. (No. 2 grade)	29.50-29.75
108 alloy	30.00-30.25
195 alloy	31.25-31.50
13 alloy	32.50-33.00
AXS-679	30.00-30.25

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	31.00-31.50
Grade 2—92-95%	29.50-29.75
Grade 3—90-92%	29.00-29.25
Grade 4—85-90%	28.50-28.75

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	39⅛
Electrodeposited	33⅜
Rolled, oval, straight, delivered	38⅞
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	26½
Ball anodes	25½
Nickel 99 pct plus	
Cast	68.00
Rolled, depolarized	69.00
Cadmium	$2.65
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79½

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	52.15
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt allowed	20½
Nickel chloride, 375 lb drum	37½
Silver cyanide, 100 oz lots, per oz.	61¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drums	45.85

SCRAP METALS

Brass Mill Scrap

(Cents per pound; add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	23	22¼
Yellow brass	20¼	18¾
Red brass	21½	20¾
Comm. bronze	21¾	21
Mang. bronze	19½	18⅝
Brass rod ends	19⅞	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	21.75
No. 2 copper wire	20.75
Light copper	19.75
Refinery brass	20.50*
Radiators	17.50

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	21.75
No. 2 copper wire	20.75
Light copper	19.75
No. 1 composition	21.50
No. 1 comp. turnings	21.00
Rolled brass	19.00
Brass pipe	21.00
Radiators	17.50
Heavy yellow brass	17.50
Aluminum	
Mixed old cast	18¾
Mixed old clips	21
Mixed turnings, dry	18¾
Pots and pans	19½
Low copper	22½

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	24½—25
No. 2 heavy copper and wire	22½—23
Light copper	21 —21½
New type shell cuttings	21 —21½
Auto radiators (unsweated)	15½—15½
No. 1 composition	18¾—19
No. 1 composition turnings	18¼—18½
Clean red car boxes	16¾—17
Cocks and faucets	16¾—17
Mixed heavy yellow brass	13½—14
Old rolled brass	15 —15½
Brass pipe	17¾—18
New soft brass clippings	18½—19
Brass rod ends	17½—18
No. 1 brass rod turnings	17 —17½
Aluminum	
Alum. pistons and struts	11½—12
Aluminum crankcases	14½—15
2S aluminum clippings	18 —18½
Old sheet and utensils	14½—15
Borings and turnings	12
Misc. cast aluminum	14½—15
Dural clips (24S)	14½—15
Zinc	
New zinc clippings	14½—15
Old zinc	11¼—11⅛
Zinc routings	8½— 9
Old die cast scrap	8¼— 8¾
Nickel and Monel	
Pure nickel clippings	60 —65
Clean nickel turnings	57 —60
Nickel anodes	60 —65
Nickel rod ends	60 —65
New Monel Clippings	22 —25
Clean Monel turnings	18 —20
Old sheet Monel	20 —22
Inconel clippings	26 —28
Nickel silver clippings, mixed	13 —14
Nickel silver turnings, mixed	12 —13
Lead	
Soft scrap, lead	14¼—14¾
Battery plates (dry)	8½— 8¾
Magnesium	
Segregated solids	9 —10
Castings	5½— 6¼
Miscellaneous	
Block tin	85 —90
No. 1 pewter	65 —68
No. 1 auto babbitt	58 —60
Mixed common babbitt	13½—14
Solder joints	19 —20
Siphon tops	58 —60
Small foundry type	17 —17½
Monotype	16 —16½
Lino. and stereotype	15 —15½
Electrotype	13¾—14¼
Hand picked type shells	11½—11¾
Lino. and stereo. dross	8 — 8½
Electro. dross	6½— 6¾

MARKETS—PRICES—TRENDS

SCRAP
Iron & Steel

Formula Price Front is Cracking

A draft is blowing through a crack in the wall of the formula front. The wall still stands but the trade in some important scrap centers—people adept at skinning a cat in more ways than one—are outflanking the structure, skirting around it.

A breakthrough on the formula came in Detroit this week. Mills still maintained that the line was being held but it was a different story at the buying level. It was freely admitted there that new orders cannot be filled at formula prices.

Many sales above formula in Philadelphia pushed the price of No. 1 heavy above the formula to a top of $44. The formula was hanging on by a thread in Chicago and in Pittsburgh the mills held on for dear life.

The formula has been hammered hard. Reports of upgrading and so-called "springboards" that added freight charges have been coming hot and heavy. Strength of all other free items has been another undermining factor. In Detroit, a price range evolved in which the top price is a representative quotation for scrap being purchased for conversion or to fill old orders while the bottom of the spread is the formula at which some scrap still moves — sluggishly.

Cleveland saw a market that could easily turn into a $50 free-for-all.

PITTSBURGH—Although some of the small mills are losing inventory due to inability to get scrap at formula prices, the market is still under control here on the heavy melting grades. The trade is jittery, however. The mills are hanging on for dear life because of a fear that if the formula is broken prices will skyrocket out of sight in short order. It is generally acknowledged that even an upward revision of the formula will bring out no more scrap. Low phos, railroad and cast grades were stronger.

CHICAGO—The formula is holding here—by a mere thread. The volume of scrap moving at formula prices has been reduced to a trickle—where it has not disappeared altogether. Dealer resistance is strong and persistent reports of upgrading and the comparatively high prices being paid for railroad scrap reflects the strong underlying pressures that have been built up in this area. Most railroad grades are up again this week.

PHILADELPHIA—While mills are doggedly trying to hold to the formula level, there have been so many sales above it that the THE IRON AGE is showing a spread of $39 to $44 per gross ton for No. 1 heavy melting steel. The higher price has been paid by converters and some of the smaller mills. Shipments of formula priced material have been falling off steadily and there has been some upgrading of scrap. The currently quoted prices have caused increased imports of scrap.

NEW YORK—The market here was a lot stronger in all directions. Very little of the steelmaking grades was being purchased at formula prices. One source said that dealers were hesitant to sell. Cast was very strong and all grades advanced. Smaller mills were having an especially hard time with the formula.

DETROIT—Persistent attacks on scrap prices during recent weeks have finally resulted in a breakthrough of the formula price line. While mills insist the formula is still holding it is freely admitted that new orders cannot be filled at formula prices. To reflect this condition, THE IRON AGE this week shows a price range in which the top price is a representative quotation for scrap being bought for conversion or to fill old orders while the low price is the formula price at which some industrial and dealer scrap is still moving. With the exception of machine shop and mixed borings the top Detroit price is up from $2 to $4.50.

CLEVELAND—A market that could easily turn into a $50 free-for-all was on the formula here and in the Valley at press time. District consumers, including converters, are buying on the formula plus so-called "springboard" basis and tonnage is moving. However, the margins of supply are narrowing. Mills are taking all they can get at their price but this is not enough with winter approaching. Foundry grades are running wild.

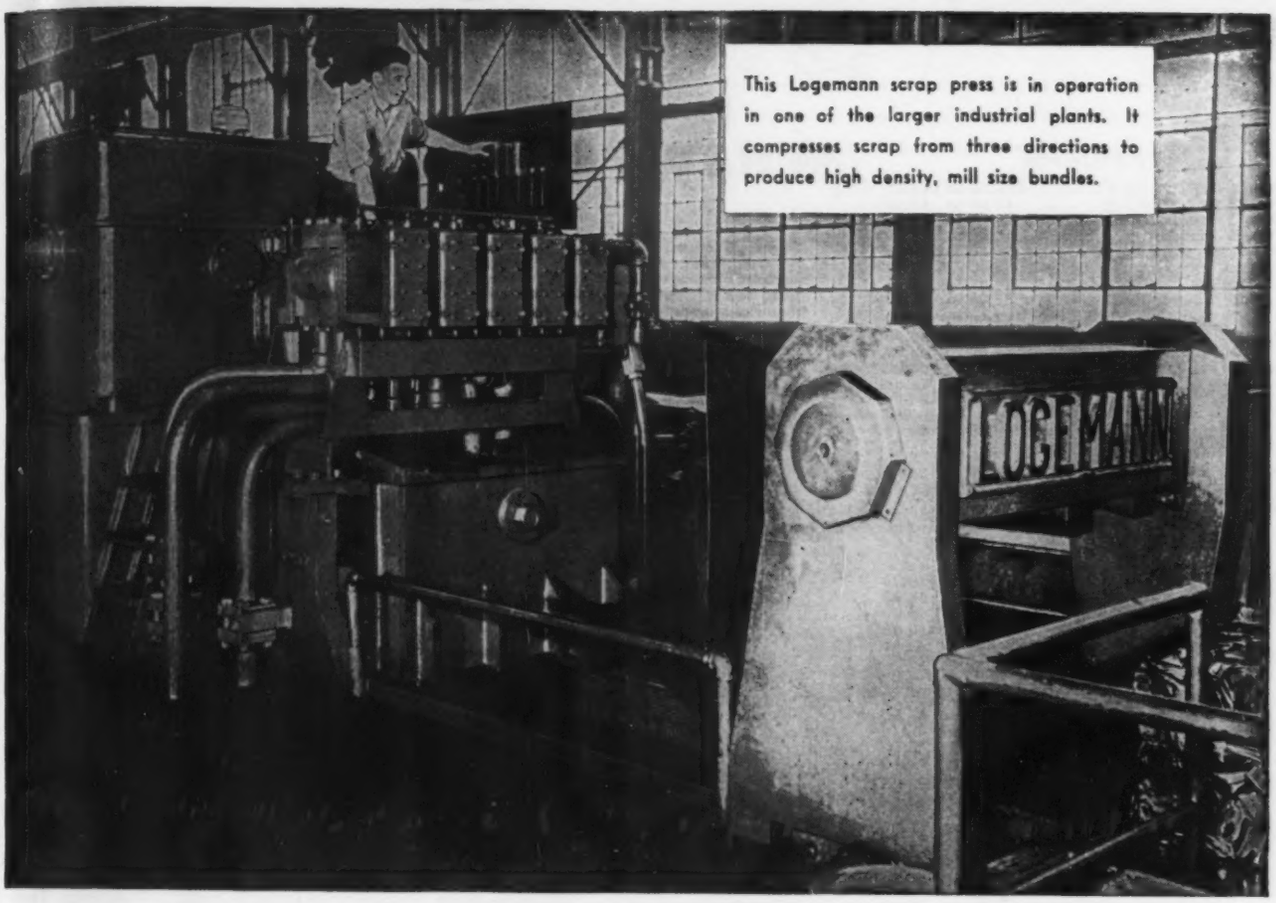
ST. LOUIS—Foundry grades continue to hold the spotlight in the St. Louis market, and prices generally are higher as a result of heavier demand from consumers here and in other markets, plus a short supply. Openhearth furnaces are holding firm to their formula. Chemical plants' buying of turnings has upped their prices.

CINCINNATI—Demand is strong and supply inadequate here as formula prices continued to hold. Dealers are selling only occasional cars and the prevailing sentiment in the trade here is that No. 1 heavy melting steel ought to bring $46 to $46.50, a feat nobody has been able to perform. Mills are buying and getting shipments on the formula basis. The price increase on No. 2 steel made 2 weeks ago has not increased the movement of No. 1 as hoped, but has brought out more No. 2.

BOSTON—Continued strength in cast with No. 1 machinery cast selling for $46 to $47 featured the market here. All other grades of cast moved up too. Mixed cupola went to a top of $42 from $38. Scrap items held the price line.

BIRMINGHAM—There has not been enough cast coming into the district to halt the price spiral. Other scrap, too, is scarce, and one large buyer is reported sending out into the field and buying wherever scrap can be found. There has been a lot of talk by foundries in the district that foreign pig iron in large quantities will come into the district.

BUFFALO — Stronger tendencies ruled the scrap market during the week. Steelmaking items were still quoted at formula ranges, but higher prices ruled the cast market with No. 1 cupola selling within a range of $46.50-$47, up $2. The market here appeared reluctant to move ahead, but was forced to advance by strength in other steelmaking centers.



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Iron and Steel

SCRAP PRICES

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$43.50 to $44.00
No. 2 hvy. melting	40.50 to 41.00
No. 1 bundles	46.00 to 46.50
No. 2 bundles	38.50 to 39.00
Machine shop turn.	34.50 to 35.00
Mixed bor. and ms. turns.	34.50 to 35.00
Shoveling turnings	37.50 to 38.00
Cast iron borings	37.00 to 37.50
Low phos. plate	55.50 to 56.00
Heavy turnings	45.50 to 46.00
No. 1 RR. hvy. melting	44.00 to 45.00
Scrap rails, random lgth.	62.50 to 63.00
Rails 2 ft and under	67.00 to 68.00
RR. steel wheels	59.00 to 60.00
RR. spring steel	59.00 to 60.00
RR. couplers and knuckles	59.00 to 60.00
No. 1 machinery cast	59.50 to 60.00
Mixed yard cast.	54.50 to 55.00
Heavy breakable cast	51.50 to 52.00
Malleable	68.00 to 69.00

Chicago

No. 1 hvy. melting	$39.50 to $40.00
No. 2 hvy. melting	37.50 to 38.00
No. 1 factory bundles	39.50 to 40.00
No. 1 dealers' bundles	39.50 to 40.00
No. 2 dealers' bundles	34.00 to 35.00
Machine shop turn.	33.00 to 34.00
Mixed bor. and turn.	33.00 to 34.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	33.00 to 34.00
Low phos. forge crops	54.00 to 55.00
Low phos. plate	51.00 to 52.00
No. 1 RR. hvy. melting	46.50 to 47.50
Scrap rails, random lgth.	59.00 to 60.00
Rerolling rails	65.00 to 66.00
Rails 2 ft and under	65.00 to 66.00
Locomotive tires, cut	57.00 to 58.00
Cut bolsters & side frames	54.00 to 55.00
Angles and splice bars	62.00 to 63.00
RR. steel car axles	89.00 to 90.00
RR. couplers and knuckles	57.00 to 58.00
No. 1 machinery cast.	58.00 to 59.00
No. 1 agricul. cast.	54.00 to 55.00
Heavy breakable cast.	49.00 to 50.00
RR. grate bars	46.00 to 47.00
Cast iron brake shoes	48.50 to 49.50
Cast iron car wheels	56.00 to 57.00
Malleable	66.00 to 67.00

Philadelphia

No. 1 hvy. melting	$39.00 to $44.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 bundles	39.00 to 44.00
No. 2 bundles	31.00 to 32.00
Machine shop turn.	28.00 to 29.00
Mixed bor. and turn.	26.00 to 27.00
Shoveling turnings	32.00 to 33.00
Low phos. punchings, plate	49.00 to 50.00
Low phos. 5 ft and under	48.00 to 49.00
Low phos. bundles	44.00 to 45.00
Hvy. axle forge turn.	39.00 to 44.00
Clean cast chem. borings	39.00 to 40.00
RR. steel wheels	51.00 to 52.00
RR. spring steel	51.00 to 52.00
Rails 18 in. and under	64.00 to 66.00
No. 1 machinery cast.	54.00 to 55.00
Mixed yard cast.	49.00 to 50.00
Heavy breakable cast.	49.00 to 50.00
Cast iron carwheels	58.00 to 60.00
Malleable	62.00 to 64.00

Cleveland

No. 1 hvy. melting	$43.00 to $43.50
No. 2 hvy. melting	40.00 to 40.50
No. 1 busheling	43.00 to 43.50
No. 1 bundles	43.00 to 43.50
No. 2 bundles	28.00 to 28.50
Machine shop turn.	35.00 to 35.50
Mixed bor. and turn.	36.00 to 36.50
Shoveling turnings	37.00 to 37.50
Cast iron borings	37.00 to 37.50
Low phos. 2 ft and under	45.50 to 46.00
Steel axle turn.	43.00 to 43.50
Drop forge flashings	43.00 to 43.50
No 1 RR. hvy. melting	43.50 to 44.00
Rails 3 ft and under	67.50 to 68.00
Rails 18 in. and under	68.50 to 69.00
No. 1 machinery cast.	63.00 to 64.00
RR. cast.	64.50 to 65.00
RR. grate bars	46.00 to 47.00
Stove plate	51.00 to 52.00
Malleable	69.00 to 70.00

Youngstown

No. 1 hvy. melting	$43.50 to $44.00
No. 2 hvy. melting	40.50 to 41.00
No. 1 bundles	43.50 to 44.00
No. 2 bundles	$38.50 to $39.00
Machine shop turn.	35.50 to 36.00
Shoveling turnings	37.50 to 38.00
Cast iron borings	37.50 to 38.00
Low phos. plate	46.00 to 46.50

Buffalo

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	37.50 to 38.50
No 1 busheling	37.50 to 38.50
No. 1 bundles	39.50 to 40.00
No. 2 bundles	36.00 to 36.50
Machine shop turn.	32.00 to 33.00
Mixed bor. and turn.	35.00 to 36.00
Shoveling turnings	35.00 to 36.00
Cast iron borings	35.00 to 36.00
Low phos. plate	44.50 to 45.00
Scrap rails, random lgth.	52.00 to 53.00
Rails 2 ft and under	59.00 to 61.00
RR. steel wheels	52.00 to 53.00
RR. spring steel	52.00 to 53.00
RR. couplers and knuckles	52.00 to 53.00
No. 1 machinery cast.	49.00 to 50.00
No. 1 cupola cast.	46.50 to 47.00
Small indus. malleable	58.00 to 60.00

Birmingham

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	33.00 to 34.00
No. 2 bundles	31.00 to 32.00
No. 1 busheling	35.50 to 36.50
Machine shop turn.	28.00 to 29.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	25.00 to 26.00
Bar crops and plate	44.00 to 45.00
Structural and plate	44.00 to 45.00
No. 1 RR. hvy. melting	41.00 to 42.00
Scrap rails, random lgth.	55.00 to 56.00
Rerolling rails	59.00 to 60.00
Rails 2 ft. and under	62.00 to 63.00
Angles & splice bars	57.00 to 58.00
Std. steel axles	61.00 to 62.00
No. 1 cupola cast.	55.00 to 56.00
Stove plate	50.00 to 51.00
Cast iron carwheels	46.00 to 47.00

St. Louis

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	36.00 to 37.00
No. 2 bundled sheets	35.00 to 36.00
Machine shop turn.	28.50 to 29.50
Shoveling turnings	32.00 to 33.00
Rails, random lengths	55.00 to 57.00
Rails 3 ft and under	63.00 to 65.00
Locomotive tires, uncut	53.00 to 54.00
Angles and splice bars	56.00 to 58.00
Std. steel car axles	76.00 to 78.00
RR. spring steel	55.00 to 57.00
No. 1 machinery cast.	54.00 to 56.00
Hvy. breakable cast.	45.00 to 47.00
Cast iron brake shoes	46.00 to 48.00
Stove plate	44.00 to 45.00
Cast iron car wheels	56.00 to 58.00
Malleable	65.00 to 66.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$34.50
No. 2 hvy. melting	$29.00 to 30.00
No. 2 bundles	28.50 to 29.00
Machine shop turn.	24.50 to 25.50
Mixed bor. and turn.	24.50 to 25.50
Shoveling turnings	26.50 to 27.50
Clean cast chem. bor.	34.50 to 35.50
No. 1 machinery cast.	46.00 to 47.00
Mixed yard cast.	43.00 to 44.00
Charging box cast.	43.00 to 44.00
Heavy breakable cast.	43.00 to 44.00
Unstrp. motor blocks	38.00 to 39.00

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$32.50
No. 2 hvy. melting	$29.00 to 29.50
No. 1 bundles	32.50
No. 2 bundles	$27.50 to $28.00
Machine shop turn.	24.00 to 24.50
Mixed bor. and turn.	23.50 to 24.00
Shoveling turnings	25.50 to 26.00
No. 1 busheling	31.50 to 32.00
Clean cast chem. borings	29.00 to 30.00
No. 1 machinery cast.	46.00 to 47.00
Mixed cupola cast.	41.00 to 42.00
Heavy breakable cast.	38.00 to 39.00
Stove plate	38.00 to 39.00

Detroit

Brokers' buying prices per gross ton, on cars

No. 1 hvy. melting	$37.50 to $39.50
No. 2 hvy. melting	32.50 to 36.00
No. 1 bundles	37.50 to 42.00
New busheling	37.50 to 42.00
Flashings	37.00 to 37.50
Machine shop turn.	29.00 to 29.50
Mixed bor. and turn.	29.00 to 29.50
Shoveling turnings	31.50 to 34.00
Cast iron borings	31.50 to 34.00
Low phos. plate	40.00 to 42.00
No. 1 cupola cast.	60.00 to 62.00
Heavy breakable cast.	51.00 to 53.00
Stove plate	51.00 to 52.00
Automotive cast.	64.00 to 66.00

Cincinnati

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	$42.00 to $42.50
No. 2 hvy. melting	39.00 to 39.50
No. 1 bundles	42.00 to 42.50
No. 2 bundles, black	39.00 to 39.50
No. 2 bundles, mixed	32.50 to 33.00
Machine shop turn.	28.50 to 29.00
Mixed bor. and turn.	29.50 to 30.00
Shoveling turnings	30.50 to 31.00
Cast iron borings	30.50 to 31.00
Low phos. 18 in. under	55.00 to 56.00
Rails, random lengths	61.00 to 62.00
Rails, 18 in. and under	69.00 to 70.00
No. 1 cupola cast.	61.00 to 62.00
Hvy. breakable cast.	51.00 to 52.00
Drop broken cast.	65.00 to 66.00

San Francisco

No. 1 hvy. melting	$26.50
No. 2 hvy. melting	24.50
No. 1 bundles	26.50
No. 2 bundles	22.50
No. 3 bundles	19.50
Machine shop turn.	13.00
Elec. fur. 1 ft and under	40.00
No. 1 RR. hvy. melting	26.50
Scrap rails, random lgth.	26.50
No. 1 cupola cast.	$43.00 to 46.00

Los Angeles

No. 1 hvy. melting	$26.50
No. 2 hvy. melting	24.50
No. 1 bundles	26.50
No. 2 bundles	22.50
No. 3 bundles	19.50
Mach. shop turn.	13.00
Elec. fur. 1 ft and under	44.00 to 47.00
No. 1 RR. hvy. melting	26.50
Scrap rails, random lgth.	26.50
No. 1 cupola cast.	$46.00 to 48.00

Seattle

No. 1 hvy. melting	$24.00 to $28.00
No. 2 hvy. melting	24.00 to 28.00
No. 1 bundles	22.00
No. 2 bundles	22.00
No. 3 bundles	18.00
Elec. fur. 1 ft and under	$29.00 to 30.00
RR. hvy. melting	25.00
No. 1 cupola cast	35.00
Heavy breakable cast.	25.00

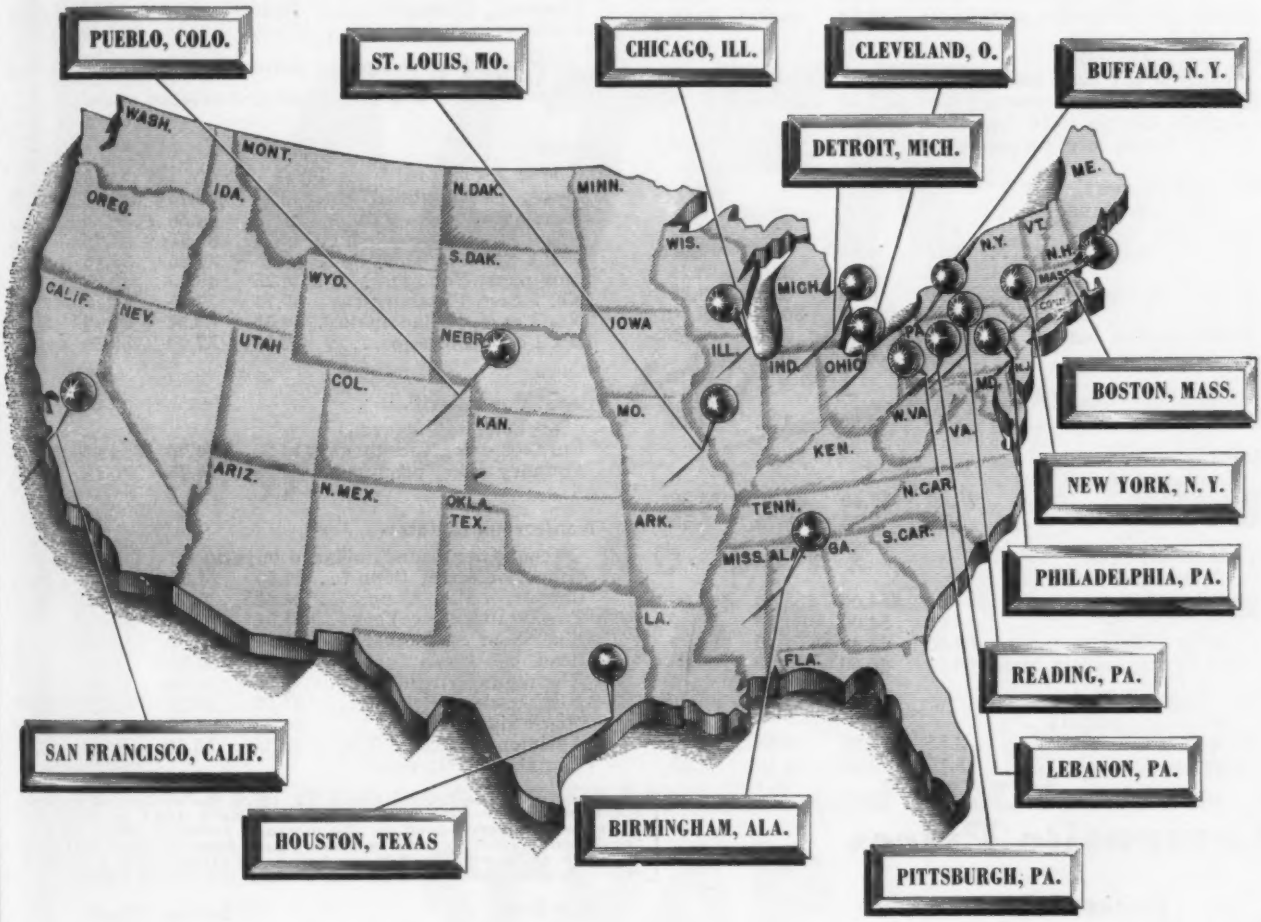
Hamilton, Ont.

No. 1 hvy. melting	$30.00
No. 1 bundles	30.00
No. 2 bundles	29.50
Mechanical bundles	28.00
Mixed steel scrap	26.00
Mixed bor. and turn.	23.00
Rails, remelting	30.00
Rails, rerolling	33.00
Bushelings	24.50
Bush., new fact, prep'd.	29.00
Bush., new fact, unprep'd.	23.00
Short steel turnings	23.00
Cast scrap	45.00

For the Purchase or Sale of

Iron and Steel Scrap . . .

CONSULT OUR NEAREST OFFICE



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CLEVELAND, O. 1022 Midland Bldg.
LEBANON, PA. Luria Bldg.
PUEBLO, COLO. 334 Colorado Bldg.
BUFFALO, N.Y. Genesee Bldg.
DETROIT, MICH. 2011 Book Bldg.
NEW YORK, N.Y. Woolworth Bldg.
READING, PA. Luria Bldg.
ST. LOUIS, MO. 2110 Railway Exchange Bldg.
SAN FRANCISCO, CAL. Pacific Gas & Elec. Co., Bldg.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices in this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel (cents per pound)	Nov. 7, 1950	Oct. 31, 1950	Oct. 10, 1950	Nov. 8 1949
Hot-rolled sheets	3.35	3.35	3.35	3.25
Cold-rolled sheets	4.10	4.10	4.10	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.25
Cold-rolled strip	4.21	4.21	4.21	4.038
Plate	3.50	3.50	3.50	3.40
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	34.50	34.50	34.50	33.00
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes.	$7.50	$7.50	$7.50	$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. ternes	6.35	6.35	6.35	6.65
Bars and Shapes: (cents per pound)				
Merchant bars	3.45	3.45	3.45	3.35
Cold finished bars	4.15	4.15	4.145	3.995
Alloy bars	3.95	3.95	3.95	3.75
Structural shapes	3.40	3.40	3.40	3.25
Stainless bars (No. 302)	30.00	30.00	30.00	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.50	4.50	4.50	4.15
Rails: (dollars per 100 lb)				
Heavy rails	$3.40	$3.40	$3.40	$3.20
Light rails	3.75	3.75	3.75	3.55
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$54.00	$54.00	$54.00	$52.00
Slabs, rerolling	54.00	54.00	54.00	52.00
Forging billets	63.00	63.00	63.00	61.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	3.85	3.85	3.85	3.40
Skelp	3.15	3.15	3.15	3.25

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron: (per gross ton)	Nov. 7, 1950	Oct. 31, 1950	Oct. 10, 1950	Nov. 8 1949
No. 2, foundry, del'd Phila.	$54.77	$52.77	$51.76	$50.42
No. 2, Valley furnace	49.50	49.50	49.50	46.50
No. 2, Southern Cin'ti	52.58	52.58	52.58	46.08
No. 2, Birmingham	45.88	45.88	45.88	39.38
No. 2, foundry, Chicago†	49.50	49.50	49.50	46.50
Basic del'd Philadelphia	53.92	51.92	50.92	49.92
Basic, Valley furnace	49.00	49.00	49.00	46.00
Malleable, Chicago†	49.50	49.50	49.50	46.50
Malleable, Valley	49.50	49.50	49.50	46.50
Charcoal, Chicago	70.56	70.56	70.56	68.56
Ferromanganese‡	173.40	173.40	173.40	173.40

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$43.75	$43.75	$43.75	$31.75
Heavy melt'g steel, Phila.	41.50	38.50	38.50	24.50
Heavy melt'g steel, Ch'go	39.75	39.75	39.75	30.50
No. 1 hy. com. sh't, Det.	37.25	37.25	37.25	25.50
Low phos. Young'n	46.25	46.25	46.25	33.75
No. 1 cast, Pittsburgh	59.75	57.75	53.75	39.50
No. 1 cast, Philadelphia	54.50	53.50	50.50	37.00
No. 1 cast, Chicago	57.00	57.00	50.50	44.00
Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.25	$14.25	$14.25	$14.25
Foundry coke, prompt	16.75	16.75	16.75	15.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	24.50	24.50	24.50	18.50
Copper, Lake, Conn.	24.625	24.625	24.625	18.625
Tin Straits, New York	$1.52†	$1.26*	$1.115	94.00
Zinc, East St. Louis	17.50	17.50	17.50	9.75
Lead, St. Louis	16.80	16.80*	15.80	12.80
Aluminum, virgin	19.00	19.00	19.00	17.00
Nickel, electrolytic	51.22	51.22	51.22	42.97
Magnesium, ingot	24.50	24.50	24.50	20.50
Antimony, Laredo, Tex.	32.00	32.00	32.00	32.00

†Tentative. *Revised.

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

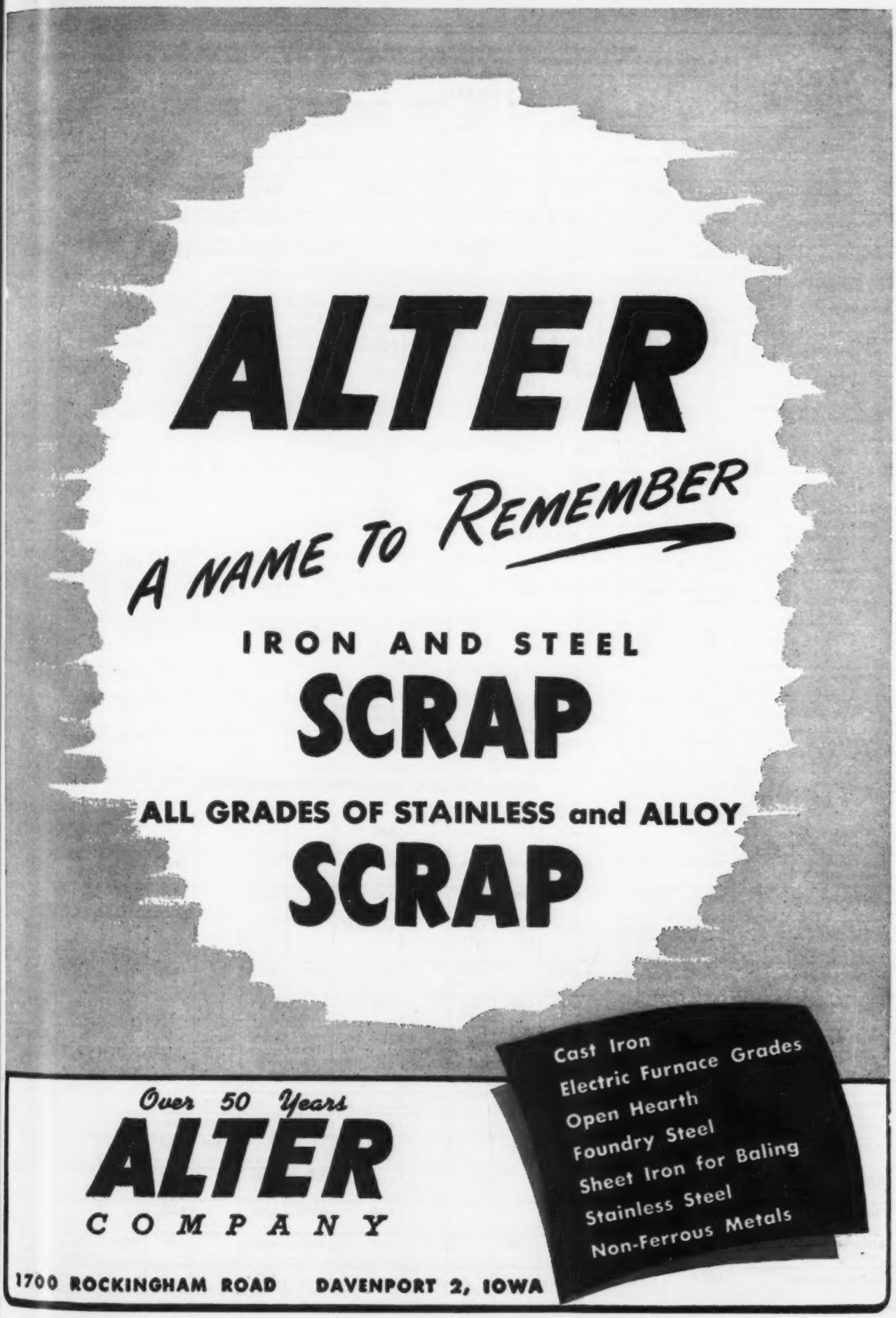
	Finished Steel Base Price	Pig Iron	Scrap Steel
Nov. 7, 1950	3.837¢ per lb.	$49.69 per gross ton	$41.67 per gross ton
One week ago	3.837¢ per lb.	49.36 per gross ton	40.67 per gross ton
One month ago	3.837¢ per lb.	49.19 per gross ton	40.67 per gross ton
One year ago	3.705¢ per lb.	45.88 per gross ton	28.92 per gross ton

	Finished Steel Base Price High	Finished Steel Base Price Low	Pig Iron High	Pig Iron Low	Scrap Steel High	Scrap Steel Low
1950	3.837¢ Jan. 3	3.837¢ Jan. 3	$49.69 Nov. 7	$45.88 Jan 3	$41.67 Nov. 7	$26.25 Jan. 3
1949	3.837¢ Dec. 27	3.3705¢ May 3	46.87 Jan. 18	45.88 Sept. 6	43.00 Jan. 4	19.33 June 28
1948	3.721¢ July 27	3.193¢ Jan. 1	46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
1947	3.193¢ July 29	2.848¢ Jan. 1	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.848¢ Dec. 31	2.464¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.464¢ May 29	2.396¢ Jan. 1	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.396¢	2.396¢	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.396¢	2.396¢	23.61	23.61	$19.17	$19.17
1942	2.396¢	2.396¢	23.61	23.61	19.17	19.17
1941	2.396¢	2.396¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	32.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07542¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1932	1.89196¢ July 5	1.83910¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21[4] Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.


ALTER
A NAME TO REMEMBER
IRON AND STEEL
SCRAP
ALL GRADES OF STAINLESS and ALLOY
SCRAP
Cast Iron
Electric Furnace Grades
Open Hearth
Foundry Steel
Sheet Iron for Baling
Stainless Steel
Non-Ferrous Metals
Over 50 Years
ALTER
COMPANY
1700 ROCKINGHAM ROAD DAVENPORT 2, IOWA

IRON AGE

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$50.00[1]													$50.00[11]
Alloy, net ton	$51.00[1,17]													$51.00[11]
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$53.00[1]	$53.00[1]	$53.00[1]				$57.00[13]		$53.00[3]	$62.00[26]	$53.00[3]			
Carbon forging billets, net ton	$63.00[1]	$63.00[1,4]	$63.00[1,8]	$63.00[4]			$63.00[25]		$63.00[3,4]	$68.00[26]	$63.00[3]			$68.00[31]
Alloy, net ton	$68.00[1,17]	$68.00[1,4]	$68.00[1]		$66.00[4,42]			$68.00[3]	$66.00[3,4]	$70.00[26]	$66.00[3]			$69.00[31]
PIPE SKELP	3.15[1]						3.15[1,4]							
WIRE RODS	3.85[2] 4.05[18]	3.85[2,4,33]	3.85[6]	3.85[2]			3.85[6]				3.85[3]	3.95[3]		
SHEETS Hot-rolled (18 ga. & hvr.)	3.35[1,5,9,15]	3.35[22]	3.35[1,6,8]	3.35[4,5]			3.35[1,4,6] 3.75[13]		3.35[3]	3.60[26]		3.35[3]	4.05[22]	3.55[12] 4.15[47]
Cold-rolled	4.10[1,5,7,9,15] 5.10[63]		4.10[1,6,8]	4.10[4,15]		4.10[7]	4.10[4,6]		4.10[3]			4.10[3]	4.80[22]	4.30[12]
Galvanized (10 gage)	4.40[1,9,15]		4.40[1,8]		4.40[4]		4.75[44] 5.50[64]					4.40[3]		
Enameling (12 gage)	4.40[1]		4.40[1,8]	4.40[4]		4.40[7]	4.40[6] 4.90[76] 5.55[64]						5.10[22]	4.70[12]
Long ternes (10 gage)	4.80[9,15]		4.80[1]			4.80[7]	5.30[64]							
Hi Str. low alloy, h.r.	5.05[1,5] 5.30[9]	5.05[1]	5.05[1,6,8]	5.05[4,5]			5.05[1,4] 5.30[6] 5.40[13]		5.05[3]	5.05[26]		5.05[3]		5.50[12]
Hi str. low alloy, c.r.	6.20[1,5] 6.45[9]		6.20[1,6,8]	6.20[4,5]			6.20[4,] 6.45[6]		6.20[3]			6.20[3]		6.65[12]
Hi str. low alloy, galv.	6.75[1]											6.75[3]		
STRIP Hot-rolled	3.25[5,7,9] 3.50[28] 3.75[41,58]	3.25[3,66]	3.25[1,6,8]	3.25[5]			3.25[1,4,6] 3.75[13]		3.25[3]	3.50[26]		3.25[3]		3.45[12] 4.05[47]
Cold-rolled	4.15[5,7,9] 4.85[63,58]	4.30[6] 4.50[66]	4.30[6]	4.15[2,5]		4.15[7]	4.15[4,6,48,] 4.85[13,40] 4.75[49]		4.15[3]			4.15[3]		4.35[12] 4.95[47] 5.10[61,68]
Hi str. low alloy, h.r.	5.50[9]		4.95[1,6,8]	4.95[5]			4.95[1,4] 5.20[6] 5.30[13]		4.95[3]	4.95[26]		4.95[3]		5.40[12]
Hi Str. low alloy, c.r.	6.45[9]			6.20[2,5]			6.20[4] 6.45[6] 6.55[13]		6.40[3]			6.40[3]		6.40[12]
TINPLATE† Cokes, 1.50-lb base box 1.25 lb, deduct 20¢	$7.50[1,5,9,15]		$7.50[1,6,8]				$7.50[4]					$7.60[3]	$7.70[22]	
Electrolytic 0.25, 0.50, 0.75 lb box	Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price													
BLACKPLATE, 29 gage Hollowware enameling	5.30[1,5,15]		5.30[1,6]				5.30[4]					5.40[3]	5.50[22]	
BARS Carbon steel	3.45[1,5,9]	3.45[1,4,23]	3.45[1,6,8]	3.45[4]	3.45[4]		3.45[1,4,6]		3.45[3,4]		3.45[3]			3.65[12]
Reinforcing‡	3.45[1,5]	3.45[4]	3.45[1,6,8]	3.45[4]			3.45[1,4,6]		3.45[3,4]		3.45[3]	3.45[3]		
Cold-finished	4.15[2,4,5,17,52,69,71]	4.15[2,23,69,70]	4.15[4,73,74]	4.15[2,61]	4.15[4,32,52]		4.15[6,40,57]		4.15[70]					4.35[12] 4.30[64]
Alloy, hot-rolled	3.95[1,17]	3.95[1,4,23]	3.95[1,6,8]		3.95[4]		3.95[1,6,25]	3.95[3]	3.95[3,4]		3.95[3]			4.25[12] 4.10[51]
Alloy, cold-drawn	4.90[2,17,52,69,71]	4.90[2,23,69,70]	4.90[4,73,74]	4.90[2,61]	4.90[4,42,52]		4.90[6,25,57]	4.90[3]	4.90[3,70]					5.05[64]
Hi str. low alloy, h.r.	5.20[1,5]		5.20[1,6,8]	5.20[4]			5.20[1] 5.45[6]	5.20[3]	5.20[3]		5.20[3]			5.65[12]
PLATE Carbon steel	3.50[1,5]	3.50[1]	3.50[1,6,8]	3.50[4]			3.50[1] 3.75[13]		3.50[3]	3.75[26]	3.50[3]	3.50[3]	4.20[22]	3.75[12]
Floor plates	4.55[1]	4.55	4.55[3]	4.55[5]						4.55[26]				
Alloy	4.40[1]	4.40[1]	4.40[1]				4.75[13]			4.55[26]	4.40	4.40[3]		
Hi Str. low alloy	5.35[1,5]	5.35[1]	5.35[1,3]	5.35[4,5]			5.60[6] 5.70[13]			5.35[26]	5.35[3]	5.35[3]		5.85[12]
SHAPES, Structural	3.40[1,5,9]	3.40[1,23]	3.40[1,6,8]					3.45[3]	3.45[3]		3.45[3]			
Hi str. low alloy	5.15[1,5]	5.15[1]	5.15[1,6,8]				5.40[6]	5.20[3]	5.20[3]		5.20[3]			
MANUFACTURERS' WIRE Bright	4.50[2,5] 4.75[18]	4.50[2,4,12,34] 4.80[33]		4.50[2,77]			4.50[6]	Kokomo—4.60[39]			4.50[3]	4.60[3]	Duluth—4.50[2] Pueblo—4.75[14]	
PILING, Steel Sheet	4.20[1,9]	4.20[1]							4.20[3]					

STEEL PRICES

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
			F=$76.00		INGOTS Carbon forging, net ton
	$59.00[83]		F=$77.00		Alloy, net ton
		$53.00[11]	F=$72.00[19]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$71.00[83]	$63.00[11]	F=$82.00[19]	Geneva=$63.00[16]	Carbon forging billets, net ton
	$74.00[83]		F=$85.00[19]		Alloy net ton
					PIPE SKELP
	4.25[83]	3.85[11]	SF=4.50[24] LA=4.65[24,62]	Portsmouth=3.85[30] Worcester=4.15[2]	WIRE RODS
		3.35[4,11]	SF, LA=4.05[24] F=4.25[19]	Ashland=3.35[7] Niles=3.50[64], Geneva=3.45[16]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.10[11]	SF=5.05[24] F=5.00[19]		Cold-rolled
		4.40[4,11]	SF, LA=5.15[24]	Ashland=4.40[7] Kokomo=4.50[30]	Galvanized (10 gage)
		4.40[11]			Enameling (12 gage)
					Long ternes (10 gage)
		5.05[11]	F=6.00[19]		Hi str. low alloy, h.r.
			F=7.05[19]		Hi str. low alloy, c.r.
					Hi str. low alloy, galv.
3.85[83]	3.65[83]	3.25[11]	SF, LA=4.00[24,62] F=4.40[19], S=4.25[62]	Ashland=3.25[7] Atlanta=3.80[65] Minnequa=4.30[14]	STRIP Hot-rolled
			F=5.75[19] LA=5.85[27]	New Haven=4.65[2], 5.35[68] Trenton=5.00[45]	Cold-rolled
		4.95[11]	F=5.90[19]		Hi str. low alloy, h.r.
			F=6.95[19]		Hi str. low alloy, c.r.
		7.60[11]	SF=8.25[24]		TINPLATE Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.05[83]	3.85[83]	3.45[4,11]	SF, LA=4.15[24] LA=4.15[62]	Atlanta=4.00[65]	BARS Carbon steel
4.05[83]	3.85[83]	3.45[4,11]	SF, S=4.20[62] F=4.10[19]	Atlanta=4.00[65] Minnequa=4.25[14]	Reinforcing‡
				Putnam, Newark=4.55[69]	Cold-finished
4.55[83]	4.35[83]		LA=5.00[62] F=4.95[19]		Alloy, hot-rolled
				Newark,[69] Worcester[2]=5.20 Hartford=5.20[4]	Alloy-, cold-drawn
		5.20[11]	F=6.25[19]		Hi str. low alloy, h.r.
	3.90[83]	3.50[4,11]	F=4.10[19] S=4.40[62] Geneva=3.50[16]	Claymont=3.90[29] Coatesville=3.90[21] Harrisburg=4.25[38]	PLATE Carbon steel
				Harrisburg=5.25[38]	Floor plates
			F=5.40[19]	Coatesville=4.80[21]	Alloy
		5.35[11]	F=5.95[19]	Geneva=5.35[16]	Hi str. low alloy
4.00[83]	3.80[83]	3.40[11]	SF=3.95[62] LA=4.00[24,62]	Phoenixville=4.25[56] Gen'a=3.40[16] Minnequa=3.85[14]	SHAPES, Structural
		5.15[11]	F=4.00[19] S=4.05[62]	Fontana=5.75[19] Geneva=5.15[16]	Hi str. low alloy
5.10[83]	4.90[83]	4.50[4,11]	SF, LA=5.45[24,62,14]	Portsmouth=4.50[30] Worcester=4.80[2]	MANUFACTURERS' WIRE Bright

Notes: †Special coated mfg ternes deduct $1.15 from 1.50-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct $1.90 from 1.50-lb coke base box. ‡Straight lengths only from producer to fabricator.

KEY TO STEEL PRODUCERS

With Principal Offices

1 Carnegie-Illinois Steel Corp., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Steel Corp., Oakland, Calif.
20 Portsmouth Div., Detroit Steel Corp., Detroit
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calif. Cold Rolled Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Worth Steel Co., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Iron & Steel Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio*
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimmons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Francisco
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wyckoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Hammond, Ind.
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forging Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit

*Add 10 pct to quoted prices

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STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	13.75	14.50	16.00	15.50	23.75	19.25	21.00	12.25	14.25	12.50
Slabs, billets, rerolling	18.00	19.25	21.25	20.25	31.25	25.50	27.75	16.60	19.50	16.25
Forg. discs, die blocks, rings	32.00	32.00	34.50	33.50	50.50	38.00	42.50	26.00	26.50	26.50
Billets, forging	25.75	25.75	27.75	27.00	40.50	30.50	34.25	21.00	21.50	21.50
Bars, wire, structurals	30.00	30.00	32.50	31.50	47.50	35.50	40.00	24.50	25.00	25.00
Plates	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50-27.00	26.50
Sheets	39.00	39.00	41.00	41.00	54.50	47.00	51.50	34.50	35.00	37.00
Strip, hot-rolled	26.50	27.00	31.25	29.00	47.25	35.75	40.00	22.50	29.25	23.00
Strip, cold-rolled	32.00	34.50	38.00	38.50	56.50	46.00	50.00	28.50	35.00	29.00

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38, 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, nd., 67; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; *Ft. Worth, Ind., 67.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

* Add 10 pct to quoted prices.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

	Cents per lb.
Armature	*6.20
Electrical	*6.70
Motor	*7.95
Dynamo	8.75
Transformer 72	9.30
Transformer 65	9.85
Transformer 58	10.55
Transformer 52	11.35

PRODUCING POINTS—Beech Bottom, W. Va., 15; Brackenridge, Pa., 28; Follansbee, W. Va., 63; Granite City, Ill., 22*; add 70¢; Indiana Harbor, Ind., 8; Mansfield, Ohio, 75; Niles, Ohio, 64, add 30¢; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7.

MERCHANT WIRE PRODUCTS

To dealers, f.o.b. mill	*Base Column Pittsburg*	*Calif.*
Std. & coated nails*§§‡	106	125§
Woven wire fence†§§‡‡	116	139
Fence posts, carloads††	116	...
Single loop bale ties‡	113	137
Gal. barbed wire**§§	126	146
Twisted barbless wire	126	146

* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 columns higher †15½ gage and heavier. §§Aliquippa 4 col. higher. ††Duluth, Joliet, Johnstown, 112. ‡Sterling, Ill., 6 columns higher; ‡‡Sterling, Ill., 2 columns higher.

	Base per 100 lb	*Pittsburg, Calif.*
Merch. wire annld.‡§§	$5.35	$6.30
Merch. wire galv.‡	5.60	6.55
Cut nails, carloads‡‡	6.75	...

‡Add 30¢ at Worcester; 20¢ at Chicago; 10¢ at Sparrows Pt. ‡‡Less 20¢ to jobbers. §Torrance 126. §§Aliquippa add 20¢.

PRODUCING POINTS — *Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire:* Alabama City, Ala., 4; Atlanta, 65; Aliquippa, Pa., (except bale ties), 5; Bartonville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburg, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa., (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City, 83.

Fence Posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.

Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26; Warehame, Mass., 53.

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	$3.40
Joint bars, per 100 lb	4.40
Light rails, per 100 lb	3.75

	Base Price cents per lb
Track spikes†	5.60
Axles	5.25
Screw spikes	8.60
Tie plates	4.20
Pittsburg, Torr., Calif.; Seattle	4.35
Track bolts, untreated	8.85
Track bolts, heat treated, to railroads	9.10

†Kansas City, 5.85¢.

PRODUCING POINTS—*Standard rails:* Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, 3.

Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, 3; Minnequa, 14.

Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.

Track spikes: Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, 6; Youngstown, 4.

Track bolts: Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 77, 78.

Axles: Indiana Harbor, Ind., 79; Johnstown, Pa., 3.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburg, Calif., 24; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minneona, Colo., 14.

Numbers after producing points correspond to steel producers. See key on Steel Price page.

PIPE AND TUBING

Base discounts, f.o.b. mills
Base price about $200.00 per net ton

Standard, T & C

Steel, Buttweld*

	Black	*Galv*
½-in.	40½ to 38½	21 to 18½
¾-in.	43½ to 41½	25 to 21½
1-in.	46 to 44	28 to 22
1¼-in.	46½ to 44½	28½ to 23
1½-in.	47 to 45	29 to 23½
2-in.	47½ to 45½	29½ to 24
2½ to 3-in.	48 to 46	30 to 27

Steel, Lapweld

2-in.	38	16½
2½ to 3-in.	42	21
3½ to 6-in.	43 to 40	22 to 21½

Steel, seamless

2-in.	36	17½ to 14½
2½ to 3-in.	39	20½ to 18
3½ to 6-in.	41	22½ to 20

Wrought iron, buttweld

½-in.	+26½	+58½
¾-in.	+16½	+47½
1 & 1¼-in.	+10½	+38½
1½-in.	+ 4½	+35
2-in.	+ 4	+34½

Wrought iron, lapweld

2-in.	+13½	+42½
2½ to 3½-in.	+11	+38
4-in.	+ 6	+32
4½ to 8-in.	+ 8	+33½
9 to 12-in.	+18	+43

Extra Strong, Plain Ends

Steel, buttweld

½-in.	39½ to 37½	21½ to 17½
¾-in.	43½ to 41½	25½ to 21½
1-in.	45½ to 43½	28½ to 23½
1¼-in.	46 to 44	29 to 24½
1½-in.	46½ to 44½	29½ to 25
2-in.	47 to 45	30 to 25½
2½ to 3-in.	47½ to 45½	30½ to 23½

Steel, lapweld

2-in.	37	15½
2½ to 3-in.	42	21
3½ to 6-in.	44½ to 41½	23½ to 24

Steel, seamless

2-in.	35	17½ to 14½
2½ to 3-in.	38	21½ to 18
3½ to 6-in.	42½	25 to 20

Wrought iron, buttweld

½-in.	+22	+52½
¾-in.	+15½	+45½
1 to 2-in.	+ 5½	+34½

Wrought iron, lapweld

2-in.	+10½	+39
2½ to 4-in.	+ 1	+37½
4½ to 6-in.	+ 5	+32
7 & 8-in.	list	+27
9 to 12-in.	+11½	+35

Threads only, butt, lapweld and seamless pipe, 1 pt higher disc. (lower price). Plain ends, butt, lapweld and seamless, 3 in. & under, 3 pts higher disc. Lapweld, seamless, 3½ in. & over, 4 pt higher disc. Buttweld & lapweld steel pipe, jobbers disc. 5 pct.

*Fontana, Calif., deduct 11 pts from left col.; galv., deduct 14 to 13 pts. Bethlehem, Youngstown, add average $3.80 per ton on galv. Republic Steel, galv., add $5 per ton for ½ to ¾ in.; $4 per ton for 1 to 1¼ in.; $3 per ton for 1½ to 12 in.

BOILER TUBES

Seamless steel, electric welded commercial boiler tubes, locomotive tubes, minimum wall, per 100 ft at mill, c.l. lots, cut lengths 10 to 24 ft.

OD in.	gage BWG	Seamless H.R.	Seamless C.R.	Electric Weld H.R.	Electric Weld C.D.
2	13	$20.61	$24.24	$19.99	$23.51
2½	12	27.71	32.58	26.88	31.60
3	12	30.82	36.27	29.90	35.18
3½	11	38.52	45.35	37.36	43.99
4	10	47.82	56.25	46.38	54.56

Pittsburgh Steel add, H-R: 2 in., 62¢; 2½ in., 84¢; 3 in., 92¢; 3½ in., $1.17; 4 in., $1.45. Add, C-R: 2 in., 74¢; 2½ in., 99¢; 3 in., $1.10; 3½ in., $1.37; 4 in., $1.70.

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb. (Metropolitan area delivery, add 20¢ to base price except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul (*), add 15¢; Philadelphia, add 25¢, Chicago, add 30¢).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140 Ann.
Baltimore	5.18	6.39[1]	6.55[2] 6.65	5.89-6.59[11]	....	5.40-6.04[11]	5.69	5.59	6.19	9.69	9.99	11.12	11.49
Birmingham*	5.15[10]	5.95	6.15[7]	5.18	....	5.55	5.25	5.10	5.69	....	....	....	....
Boston	5.75	6.85[10]	6.94[9] 7.14	5.70	6.90-6.95	6.08	5.75	5.60	6.19-6.69	9.70-9.97	9.50-10.00	11.18	11.48
Buffalo	5.15	5.95	6.94	5.41	7.27	5.65	5.35	5.15	5.75	9.60	9.90	11.05	11.38
Chicago*	5.18	6.20	6.95	6.10	6.30	5.40	5.25	5.10	5.65	9.25	9.55	10.70	11.00
Cincinnati*	5.42-5.97	5.99-6.24	6.39	6.35	....	5.70	5.64	5.35-5.84	5.99-6.25	9.80-9.81	9.90-10.11	11.05-11.26	11.38-11.59
Cleveland	5.15	5.95	7.00-7.10	5.24	6.35	5.52	5.37	5.12	5.75	9.30	9.60	10.81	11.11
Detroit	5.33	6.06-6.33	7.09	5.49	6.43-6.80	5.59-5.79	5.64-5.68	5.39	5.91	9.56	9.86	11.01	11.31
Houston	6.00	....	....	6.10	....	6.00	5.95	6.10	7.80	10.35-10.45	10.50-10.60	11.50	11.95-12.10
Indianapolis	....	....	....	....	7.36	....	....	....	6.15	....	....	....	....
Kansas City	5.75	6.55[10]	7.55	5.70	6.95	6.00	5.85	5.70	6.35	9.85	10.15	11.30	11.60
Los Angeles	5.90	7.45	7.70[2]	5.95	8.70[16]	6.00	5.90	5.90	7.55	10.75	10.75	12.45	12.75
Memphis	5.93	6.68	....	5.98	6.80-8.51	6.08	5.93	5.68	6.51	....	....	....	....
Milwaukee	5.29	6.09	6.94-6.99	5.24	6.32	5.54	5.39	5.24	5.89	9.39	9.69	10.84	11.14
New Orleans*	5.50[1]	6.75	....	5.55[1]	6.80	5.65	5.55[1]	5.55[1]	6.75	....	....	....	....
New York	5.52	6.85[1] 6.64	7.54[2]	5.64	6.99[1] 6.76	5.68	5.65	5.67	6.80 6.44	9.60	9.90	11.08	11.38
Norfolk	6.10[13]	7.00	....	6.30[13]	....	6.15[13]	6.20[13]	6.15[13]	7.20[13]	....	....	....	....
Philadelphia*	6.05	6.20-6.35	6.85[3] 7.25	5.65	6.29	5.65	5.45	5.60	6.21	9.35	9.65	10.80	11.10
Pittsburgh	5.15	5.95	6.80	5.20	5.95-6.00	5.35	5.25	5.10	5.75	9.25	9.55	10.70	11.00
Portland	6.60-7.10[1]	6.40[2]	....	6.85[9]	....	6.40[9]	6.50	6.45-6.45[9]	6.80[14]	12.80[18]	11.80[18]	....	....
Salt Lake City	5.85	6.70	....	7.45	8.75	6.10[3]	5.90	7.35[4]	8.75	....	....	....	....
San Francisco*	6.20	7.60[2]	7.75[2]	6.15	7.85[16]	6.10	6.00	6.00	7.55	10.75	10.75	12.45	12.75
Seattle	6.60[4]	8.15[2]	8.40[2]	6.85[4]	....	6.35[4]	6.20[4]	6.35[4]	8.55[14]	....	11.60[18]	....	13.60[19]
St. Louis	5.48	6.28	7.18	5.43	7.30	5.73	5.58	5.43	6.08	9.58	9.88	11.03	11.33
St. Paul*	5.71	6.51	7.41	5.66	6.16-6.82	5.96	5.81	5.66	6.31	9.81	10.11	11.26	11.56

BASE QUANTITIES *(Standard unless otherwise keyed on prices.)* Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets: 2000 to 9999 lb. Cold-finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:
(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	51.00	51.50	52.00	52.50	.....
Birmingham	45.38	45.88	....	.....	.....
Buffalo	49.00	49.50	50.00	.....	.....
Chicago	49.00	49.50	49.50	50.00	.....
Cleveland	52.00	52.50	52.50	53.00	57.00
Daingerfield, Tex.	45.00	45.50	45.50	....	.....
Duluth	49.00	49.50	49.50	50.00	.....
Erie	49.00	49.50	49.50	50.00	.....
Everett	....	52.25	52.75	.....	.....
Fontana	55.00	55.50	....	.....	.....
Granite City	50.90	51.40	51.90	.....	.....
Ironton, Utah	46.00	46.50	....	.....	.....
Pittsburgh	49.00*	....	....	50.00	.....
Neville Island	49.00	49.50	49.50	50.00	.....
Geneva, Utah	49.00	49.50	....	....	.....
Sharpsville	49.00	49.50	49.50	50.00	.....
Steelton	51.00	51.50	52.00	52.50	57.00
Swedeland	53.00	53.50	54.00	54.50	.....
Toledo	49.00	49.50	49.50	50.00	.....
Troy, N. Y.	51.00	51.50	52.00	....	57.00
Youngstown	49.00	49.50	49.50	50.00	.....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$.60-.80	.....	52.85-53.05	53.55-53.75	.....	.....
Boston	Steelton	6.90	.....	....	....	....	60.90
Brooklyn	Bethlehem	4.29	.....	52.79	53.29	53.79	.....
Cincinnati	Birmingham	6.70	52.08	52.58	....	....	.....
Jersey City	Bethlehem	2.63	....	51.13	51.63	52.13	.....
Los Angeles	Geneva-Ironton	7.70	53.70	57.20	....	....	.....
Los Angeles	Fontana	....	56.70	57.20	....	....	.....
Mansfield	Toledo	3.33	49.33	49.83	50.33	50.33	54.33
Mansfield	Cleveland	3.33	52.33	52.83	52.83	53.33	57.33
Philadelphia	Bethlehem	2.39	53.39	53.89	54.39	54.89	.....
Philadelphia	Swedeland	1.44	54.44	54.94	55.44	55.94	.....
Philadelphia	Steelton	3.09	54.09	54.59	55.09	55.59	60.09
Rochester	Buffalo	2.63	51.63	52.13	52.63	.....	.....
San Francisco	Geneva-Ironton	7.70	58.70	57.20	....	.....	.....
San Francisco	Fontana	....	56.70	57.20	....	.....	.....
Seattle	Geneva-Ironton	7.70	53.70	54.20	....	.....	.....
Seattle	Fontana	7.70	56.70	57.20	....	.....	.....
St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....
Syracuse	Buffalo	3.58	52.58	53.08	53.58	.....	.....

* *Monessen, $51.00.*

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct C/L per g.t., f.o.b. Jackson, Ohio—$59.50; f.o.b. Buffalo, $60.75. Add $1.50 per ton for each additional 0.50 pct Si up to 17 pct. Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $62.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $70.56. High phosphorus charcoal pig iron is not being produced.

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Round work can be formed, tapered, reduced etc. on Hartford Special Swagers much faster than by turning, hollow milling or other methods. No material is removed during swaging; strength and hardness of material is increased; a finer, smoother finish is imparted.

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City _____ Zone____ State____

2

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	23	35
9/16 in. & ⅝ in. x 6 in. & shorter	26	37
¾ in. & larger x 6 in. & shorter..	26	37
All diam. longer than 6 in.	22	34
Lag, all diam. x 6 in. & shorter..	30	41
Lag, all diam. longer than 6 in. ..	28	39
Plow bolts	40	—

Nuts, Hot Pressed, Cold Punched—Sq

	Pct Off List Less Keg (Reg)	K.	Less Keg (Hvy)	K.
½ in. & smaller	23	35	23	35
9/16 in. & ⅝ in.	20	32	15	28
¾ in. to 1½ in. inclusive	23	35	10	24
1⅝ in. & larger	16	29	10	24

Nuts, Hot Pressed—Hexagon

½ in. & smaller	33	43	29	40
9/16 in. & ⅝ in.	24	36	15	28
¾ in. to 1½ in. inclusive	20	32	11	25
1⅝ in. & larger	17	30	11	25

Nuts, Cold Punched—Hexagon

½ in. & smaller	33	43	29	40
9/16 in. & ⅝ in.	30	41	25	37
¾ in. to 1½ in. inclusive	27	38	20	32
1⅝ in. & larger	20	32	15	28

Nuts, Semi-Finished—Hexagon

	Reg		Hvy	
½ in. & smaller	41	50	35	45
9/16 in. & ⅝ in.	36	46	29	40
¾ in. to 1½ in. inclusive	31	42	23	35
1⅝ in. & larger	21	33	17	30
	Light			
7/16 in. & smaller	41	50		
½ in. thru ⅝ in.	35	45		
¾ in. to 1½ in. inclusive	33	43		

Broken case or keg add 15 pct.

Stove Bolts

	Pct Off List
Packaged, steel, plain finished	56—10
Packaged, plated finish	41—10
Bulk, plain finish**	67*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets

	Base per 100 lb
½ in. & larger	$7.25
	Pct Off List
7/16 in. & smaller	43

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.

Cap and Set Screws

(In bulk)	Pct Off List
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	58
¾ in. thru 1 in. up to & including 6 in.	53
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat	51
⅝ in. thru 1 in. up to & including 6 in.	46
Milled studs	23
Flat head cap screws, listed sizes....	24
Fillister head cap, listed sizes	43
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	57

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)

	Per gross ton
Old range, bessemer	$8.10
Old range, nonbessemer	7.95
Mesabi, bessemer	7.85
Mesabi, nonbessemer	7.70
High phosphorus	7.70

After Jan. 25, 1950, increases or decreases in Upper Lake rail freight, dock handling charges and taxes are for buyers' account.

PRECISION STAMPINGS
quickly... economically
DIAMOND G STAMPINGS
CUT COSTS... TIME
SAVE EQUIPMENT
Let our "know-how" and modern equipment save you dollars and time in getting metal stampings. We specialize in small and medium size stampings and produce them to precise specifications at minimum cost.
COMPLETE EQUIPMENT
Garrett equipment includes not only high speed presses of all sizes, but complete equipment for finishing, heat treating, tapping, welding and plating to assure you of high quality, inexpensive precision stampings.
DIAMOND G SERVICE
...delivers them when you need them ... where you need them.
OTHER GARRETT PRODUCTS
Lock washers ... flat washers ... spring stampings ... snap and retainer rings ... hose clamps.
Manufactured by
GEORGE K. GARRETT Co., Inc.
Philadelphia 34, Pa.
GARRETT
OF PHILADELPHIA

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb
	GRAPHITE	
17, 18, 20	60, 72	17.00¢
8 to 16	48, 60, 72	17.00¢
7	48, 60	18.64¢
6	48, 60	19.95¢
4, 5	40	20.48¢
3	40	21.53¢
2½	24, 30	22.05¢
2	24, 30	24.15¢
	CARBON	
40	100, 110	7.65¢
35	65, 110	7.65¢
30	65, 84, 110	7.65¢
24	72 to 104	7.65¢
20	84, 90	7.65¢
17	60, 72	7.65¢
14	60, 72	8.16¢
10, 12	60	8.42¢
8	60	8.67¢

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct,		
Coatesville, Pa. (21)	*28.00	
Washgtn, Pa. (39)	*28.00	
Claymont, Del. (29)	*28.00	
Conshohocken, Pa. (26)		*24.00
New Castle, Ind. (55)	*26.50	*25.50
Nickel-carbon		
10 pct, Coatesville (21)	31.00	
Inconel-carbon		
10 pct, Coatesville (21)	39.00	
Monel-carbon		
10 pct, Coatesville (21)	32.00	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)		77.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)		7.75

*Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.00
18	4	1	—	5	$1.565
18	4	2	—	—	$1.13
1.5	4	1.5	8	—	71.5¢
6	4	2	6	—	76.5¢

High-carbon-chromium	57.5¢
Oil hardened manganese	32¢
Special carbon	29.5¢
Extra carbon	24.5¢
Regular carbon	21¢

Warehouse prices on and east of Mississippi are 3¢ per lb higher. West of Mississippi, 5¢ higher.

COKE

Furnace, beehive (f.o.b. oven)	Net Ton
Connellsville, Pa.	$14.00 to $14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	$16.50 to $17.00
Foundry, oven coke	
Buffalo, del'd	$25.35
Chicago, f.o.b.	21.00
Detroit, f.o.b.	23.00
New England, del'd	24.30
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	22.10
Swedeland, Pa., f.o.b.	22.00
Painesville, Ohio, f.o.b.	23.25
Erie, del'd	$22.29 to 22.50
Cleveland, del'd	22.62
Cincinnati, del'd	22.71
St. Paul, f.o.b.	21.00
St. Louis, f.o.b.	24.90
Birmingham, del'd	20.79

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net: Effective CaF, content:

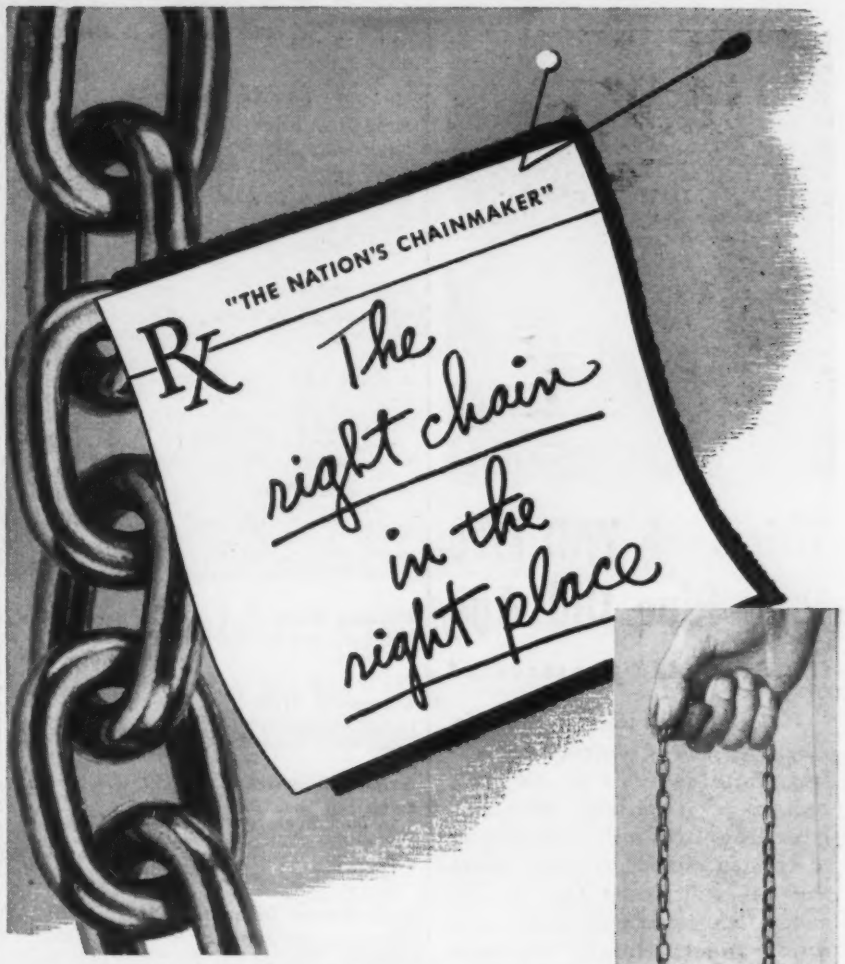
70% or more	$41.00
60% or less	38.00

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.50¢
0.41 to 0.60 carbon	5.95¢
0.61 to 0.80 carbon	6.55¢
0.81 to 1.05 carbon	8.50¢
1.06 to 1.35 carbon	10.80¢

Worcester, add 0.30¢; Sharon, New Britain, Carnegie, New Castle, add 0.35¢.



Here at York, we do not think of chain-making as merely a matter of producing tonnage. To offer a line of products as complete as the AMERICAN CHAIN line requires an intimate knowledge of chain design, the best use of alloys, proper heat-treating, galvanizing—plus the necessary machinery and equipment to take full advantage of that knowledge.

AMERICAN makes chain in sizes from that of a ship's anchor chain to that of a fish stringer. But size is only part of the story. A wide selection of patterns, material analyses and finishes—as well as a complete range of fittings and attachments—makes AMERICAN truly the

"COMPLETE CHAIN LINE"

York, Pa., Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

AMERICAN CHAIN

ACCO

AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety

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This Tank Will Live to a Ripe Old Age

It's PYROFLEX-Constructed

Pickling tanks lead a tough life. The Pyroflex-Constructed Pickling Tank above is in use in a continuous strip steel line in a large Ohio steel mill. It is subject to constant attack by acids, steam and other corrosive agents. To make this tank completely corrosion proof, Knight engineers installed Pyroflex sheet lining heat bonded to the steel shell, then covered with acid-proof brick set in Knight acid-proof cement. The result is a tank completely resistant to this highly corrosive type of service.

However, Pyroflex Construction is not always composed of these same materials. In designing various corrosion proof constructions such as tanks, chlorinating towers, floors, sewers, fume ducts, etc. Knight engineers may incorporate ceramics, carbon, glass, plastics or any other materials best suited to the individual situation. Consequently Pyroflex-Constructed units live to a ripe old age with less "down time" and lower maintenance costs.

When making inquiry regarding Pyroflex Constructions, please specify type of equipment in which interested, service conditions involved, etc.

MAURICE A. KNIGHT

311 Kelly Ave., Akron 9, Ohio

Acid and Alkali-proof Chemical Equipment

REFRACTORIES

Fire Clay Brick	*(F.o.b. works) Carloads, Per 1000*
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5)	$94.60
No. 1 Ohio	88.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	$8.00
No. 2 Ohio	79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	13.75

Silica Brick	
Mt. Union, Pa., Ensley, Ala.	$94.60
Childs, Pa.	99.00
Hays, Pa.	100.10
Chicago District	104.50
Western Utah and Calif.	111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago	111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	16.50
Silica cement, net ton, bulk, Hays, Pa.	18.70
Silica cement, net ton, bulk, Ensley, Ala.	17.60
Silica cement, net ton, bulk, Chicago District	17.60
Silica cement, net ton, bulk, Utah and Calif.	24.75

Chrome Brick	*Per Net Ton*
Standard chemically bonded, Balt., Chester	$77.00

Magnesite Brick	
Standard, Baltimore	$99.00
Chemically bonded, Baltimore	88.00

Grain Magnesite	*St. %-in. grains*
Domestic, f.o.b. Baltimore, in bulk fines removed	$62.70
Domestic, f.o.b. Chewelah, Wash., in bulk	36.30
in sacks	41.80

Dead Burned Dolomite	
F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢	$13.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

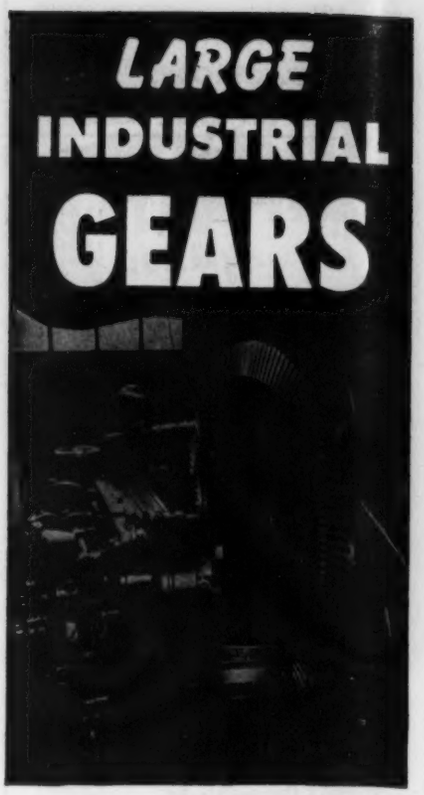
Swedish sponge iron c.i.f. New York, ocean bags	7.4¢ to 9.0¢
Canadian sponge iron, del'd, in East	10.00¢
Domestic sponge iron, 98+% Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe	36.0¢ to 39.5¢
lectrolytic iron unannealed, minus 325 mesh, 99+% Fe	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe.	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe.	70.0¢ to $1.35
Aluminum	29.00¢
Brass, 10 ton lots	30.00¢ to 33.25¢
Copper, electrolytic	10.25¢ plus metal value
Copper, reduced	10.00¢ plus metal value
Cadmium 100-199 lb	95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity	$3.50
Lead	6.5¢ plus metal value
Manganese	52.00¢
Molybdenum, 99%	$2.65
Nickel, unannealed	75.5¢
Nickel, annealed	81.5¢
Nickel, spherical, unannealed	78.5¢
Silicon	34.00¢
Solder powder	6.5¢ to 8.5¢ plus met. value
Stainless steel, 302	75.00¢
Tin	11.00¢ plus metal value
Tungsten, 99%	$3.40
Zinc, 10 ton lots	20.50¢ to 23.85¢

CAST IRON WATER PIPE

	Per net ton
6 to 24-in., del'd Chicago	$95.30 to $98.80
6 to 24-in., del'd N.Y.	94.50 to 95.50
6 to 24-in., Birmingham	81.50 to 86.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	$108.50 to $113.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

Prices Continued on Page 164



Bevel and mitre gears up to 60" dia. are cut on gear planers to accurate tolerances.

CUSTOM MADE GEARS

up to 145" diameter

You can save time, money and errors in your large and heavy industrial gear requirements with the prompt, custom service of SIMONDS GEAR. Within easy shipping distance of many heavy industry plants—with a personalized attention to your specific gear requirements—SIMONDS GEAR is able to assure you fast, accurate gear service for all heavier gear needs. Size range includes: Spur Gears up to 145"—Bevel and Mitre Gears up to 60"—Worm Gears up to 72"—also worms, worm gears, racks and pinions. Materials include: cast or forged steel, gray iron, bronze, silent steel, rawhide and bakelite. Place your next heavy gear inquiry with SIMONDS GEAR and test the difference!

Stock carrying distributors for Ramsey Silent Chain Drives and Couplings. V-Belts.

SIMONDS GEARS

THE **SIMONDS**

GEAR & MFG. CO.

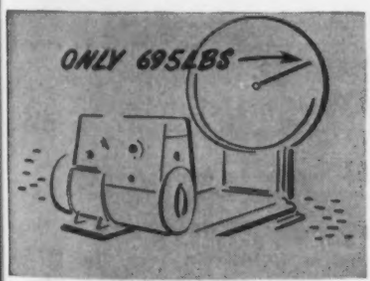
LIBERTY at 25th · PITTSBURGH 22, PA.

P&H gives you

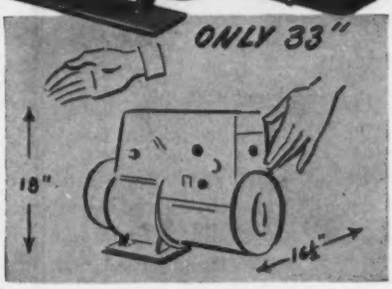
the only DC Arc Welder with *all* these tested time- and money-saving features

BUILT-IN REMOTE CONTROL Dial-lectric feature gives full arc-control at the work . . . saves operator's time . . . saves floor space for production.

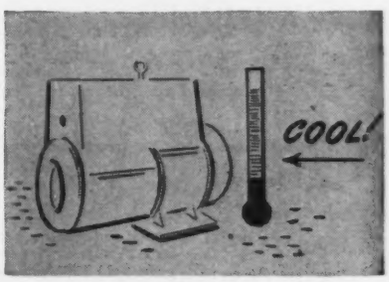
SLOW SPEED Lowest rpm per pound of weight. Only 1750 rpm for less wear, longer life, and minimum replacement costs. So quiet you hardly hear it.



LIGHT WEIGHT Easy to handle and move. Facilitates mounting off the floor and out of the way so there's more room for turning large weldments. Weighs only 695 lbs.



STURDY AND COMPACT Four sets of main brushes and one auxiliary set firmly fastened for good commutation. Simple design and rigid construction throughout . . . space-saving dimensions.



COOL OPERATION Slow speed plus extra large stator-frame cooling surfaces, and dual fans (for generator and motor) — make this the coolest welder you have ever seen.

● Stationary or portable mountings—Additional Features: single heat control; life-time sealed bearings; push-button start- and -stop switch with overload protection; high-low range switch; and polarity reversing switch. Get all the facts. Call your P&H representative, or send in coupon.

P&H **WELDING DIVISION**
Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION

Uniform, top-quality electrodes for every job!

TEAR OUT COUPON AND MAIL TODAY!

HARNISCHFEGER CORPORATION, Welding Division 2117
4401 W. National Ave., Milwaukee 14, Wisconsin

Please send me Bulletin W-80 giving full details about the outstanding new P&H WFA-300 DC arc welding machine.

Name.....

Company..... Title.....

Address..... Home ☐ Business ☐

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EXCAVATORS • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZER • CRAWLER AND TRUCK CRANES • DIESEL ENGINES • CANE LOADERS • PRE-ASSEMBLED HOMES

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NEW ISSUES

Kaiser Steel Corporation

$60,000,000

3¾% First Mortgage Bonds, Due 1970

These Bonds have been placed directly by the undersigned with institutional investors and are not offered to the public.

1,600,000 Shares of $1.46 Preferred Stock

(Cumulative—Stated Value $25 per Share)

800,000 Shares of Common Stock

(Par Value $1.00 per Share)

Offered in Units consisting of One Share of Preferred Stock and One-half Share of Common Stock, transferable only as Units until October 1, 1951, unless separated earlier as set forth in the Offering Prospectus.

Price $25 per Unit

Plus accrued dividends on the Preferred Stock from September 30, 1950

Copies of the Prospectus for the public offering of the Units may be obtained from such of the several underwriters, including the undersigned, only in States in which such underwriters are qualified to act as dealers and in which the Prospectus may legally be distributed.

The First Boston Corporation

NEW YORK BOSTON PITTSBURGH CHICAGO

PHILADELPHIA CLEVELAND SAN FRANCISCO

October 25, 1950.

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si.)

0.06% C	28.75	0.20% C	27.75
0.10% C	28.25	0.50% C	27.50
0.15% C	28.00	1.00% C	27.25
2.00% C			27.00
65-69% Cr, 4-9% C			30.50
62-66% Cr, 4-6% C, 6-9% Si.			31.35

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	26.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% Max. C.	$1.09
0.50% max. C.	1.05
.00 min. C	1.04

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 20.50¢ per lb of contained Cr plus 11.30¢ per lb of contained Si.

Bulk 1-in. x down, 20.65¢ per lb contained Cr plus 11.50¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CM5Z

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

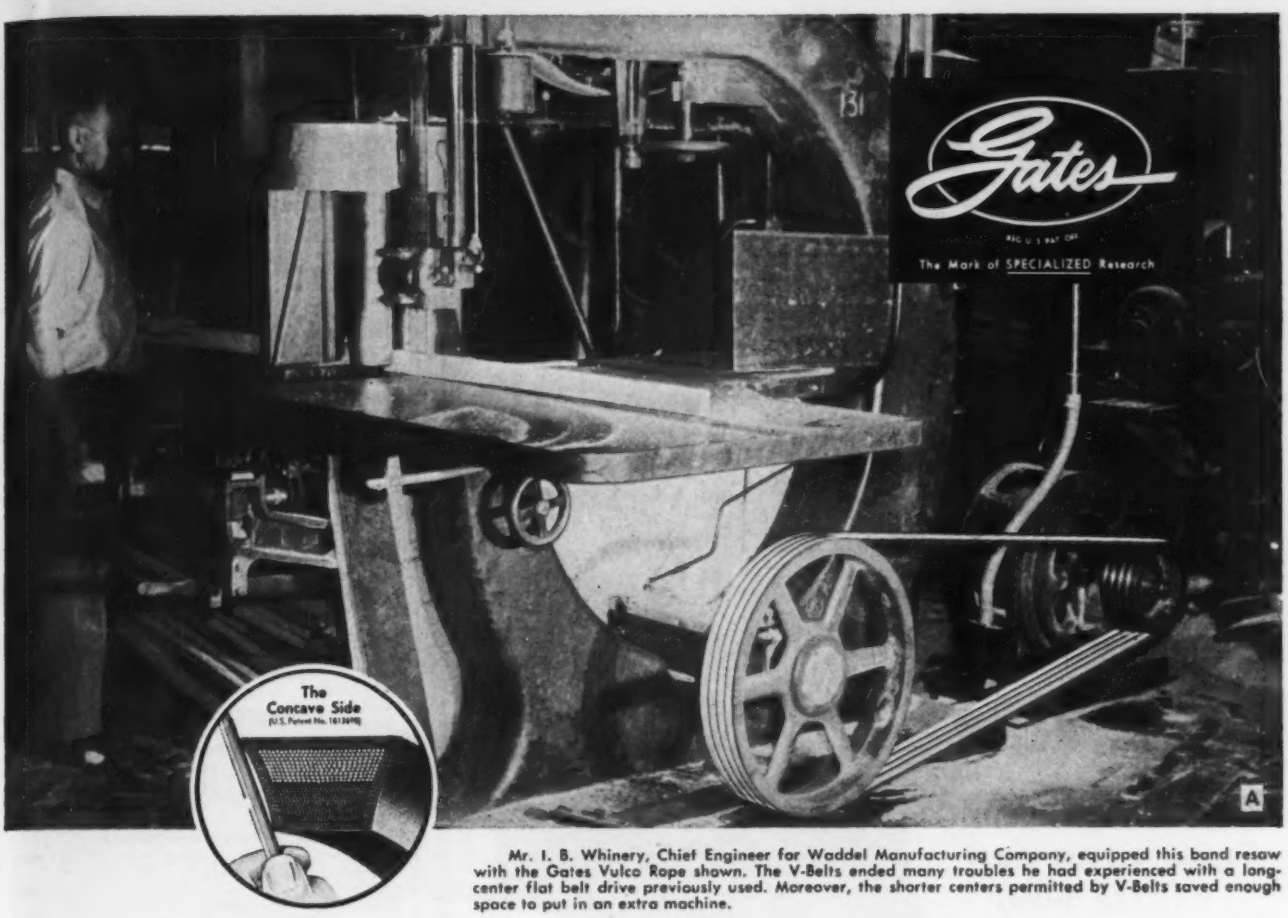
Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ⅛ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

Prices continued on page 166



Mr. I. B. Whinery, Chief Engineer for Waddel Manufacturing Company, equipped this band resaw with the Gates Vulco Rope shown. The V-Belts ended many troubles he had experienced with a long-center flat belt drive previously used. Moreover, the shorter centers permitted by V-Belts saved enough space to put in an extra machine.

If you want LOWER V-BELT COSTS, just make this simple test!

Just pick up *any* V-Belt and bend it—exactly as it bends when going around its pulley—and *see what happens!*

The top of the belt is put under tension; hence it grows *narrower.* The body the belt is under compression and *bulges out.*

This change of shape, due to bending a *straight-sided* V-Belt, is shown in figures 1 and 1-A. Note how the bulging sides are forced to press *unevenly* against the V-pulley. This naturally causes uneven wear on the sides—*concentrated wear* where the bulge is greatest.

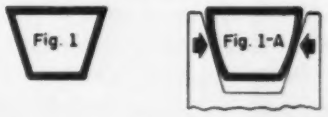
Now look at figures 2 and 2-A. There you see how the bending changes the shape of the V-Belt that is built with the Concave Side—the Gates Vulco Rope. The precisely engineered concave side of this belt merely *fill out* and become perfectly straight. There is no side-bulge. This belt, when bent, *precisely fits its sheave groove.*

Because there is *no bulging,* the sides of the Gates Vulco Rope always press *evenly* against the V-pulley and therefore wear *uniformly* —resulting in *longer belt life* and *lower belt costs for you.*

Only V-Belts made by Gates are built with concave sides. Whenever you buy V-Belts, be sure that you get the V-Belt with the Concave Sides—The Gates Vulco Rope!

What Happens When a V-Belt Bends

Straight-Sided V-Belt



How Straight-Sided V-Belt Bulges in Sheave-Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear at Point Shown by Arrows.

Gates Vulco Rope with Concave Side

The Concave Side Fills Out to a Precise Fit in the Sheave Groove. No Side Bulge! Sides Press Evenly Against the V-Pulley—Uniform Wear—Longer Life!

CS-5011

GATES VULCO ROPE DRIVES

Engineering Offices and Jobber Stocks IN ALL INDUSTRIAL CENTERS of the U.S. and 71 Foreign Countries

THE GATES RUBBER COMPANY

DENVER, U.S.A.

The World's Largest Makers of V-Belts

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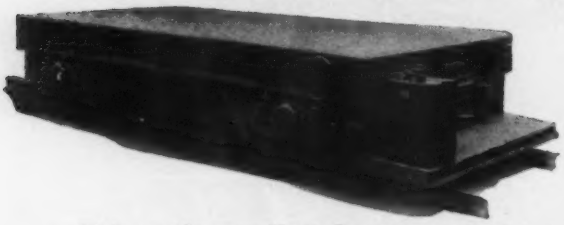
ATLAS

INTRA PLANT CARS

DESIGNED AND ENGINEERED FOR YOUR SPECIFIC NEEDS

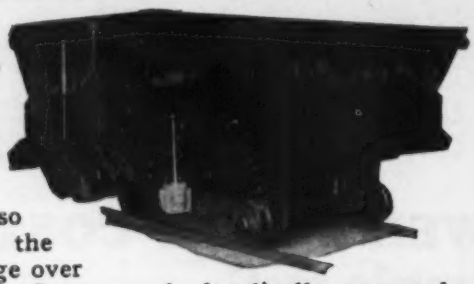
STORAGE BATTERY FLAT CAR



60-TON CAPACITY

This self-propelled flat car operates on standard gauge track. Car provided with hydraulic electric brakes that can be operated by handwheel when long overhanging loads are encountered. These battery propelled cars are often provided with charging equipment mounted on car.

FURNACE CHARGING CAR, 8-TON CAP. CENTER DUMP



The discharge gates are so arranged as to spread the charge to the best advantage over the width of the furnace. Gates are hydraulically operated through a hand pump. Car is mounted on anti-friction roller bearings with spring mounted journals. Car provided with automatic engine couplers.

CUPOLA CHARGING SCALE CAR

Car has ball bearing steel turntable on top of the car upon which charging buggies are placed and weighed. Car has anti-friction bearings at main journals.

Send for illustrated booklet on all types of intra-plant cars.

ATLAS ENGINEERING SERVICE
IS ALWAYS AT YOUR SERVICE

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

FERROALLOYS

Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.

F.o.b. Birmingham	$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont., Ashtabula, O.	$172
F.o.b. Johnstown, Pa.	$174
F.o.b. Sheridan, Pa.	$172
F.o.b. Etna, Clairton, Pa.	$175

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.45
Ton lots	12.05

Spiegeleisen

Contract prices gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$64.00	$65.00
Pgh. or Chicago	65.00	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, packed	29.75
Ton lots	31.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn ..... 18.15¢

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd., Mn. 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	25.25	27.10	28.30
0.07% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C, 7.00% max. Si	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $82.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $80.00. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 1 lb Si briquets.

Carload, bulk	6.30
Ton lots	7.90

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	17.00	75% Si	13.50
50% Si	11.30	85% Si	14.65
90-95% Si			16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Prices Continued on Page 168

Can Your Skeleton Use Tubular Bones?

Courtesy Cliffside Body Corporation

The "bones" in this skeleton are square steel tubes, welded together to make a stiff, rigid frame. The idea, used here to form a truck body, is easily adapted—you may find it profitable.

In this instance, the tubular construction, developed with the help of Frasse specialists, replaced a complicated system of bolted channels, gussets, cross fittings, angles and similar parts. Result? A stronger, more rigid, squeakless body—25% lighter, with more capacity for pay load . . . faster, neater assembly . . . greater flexibility of design . . . and 3 items to inventory instead of 60.

While mechanical tubing is widely used "to save machining the hole", it is equally handy for structural use. It pays—in product improvement, lower production cost, *often in material cost,* to think of tubing in your product.

And when you think of tubing, think of Frasse. Frasse stocks mechanical tubing, pressure, hydraulic and condenser tubing, stainless tubing—even stainless pipe and fittings. In addition, Frasse maintains a fully qualified engineering department that is always available to assist you in problems involving mechanical steels. Call us. *Peter A. Frasse and Co., Inc., 17 Grand Street, New York 13, N.Y. (Walker 5-2200) • 3911 Wissahickon Avenue, Philadelphia 29, Pa. (Baldwin 9-9900) • 50 Exchange Street, Buffalo 3, N. Y. (Washington 2000) • Jersey City • Syracuse • Hartford • Rochester • Baltimore*

Send for this FRASSE *Tubing Inventory*

This handy booklet lists each mechanical tube size immediately available from Frasse warehouse stocks—a useful reference and purchasing guide. Send the coupon for your copy today.

FRASSE *for Steel Tubing*

Seamless and Welded Mechanical Tubing

Condenser and Pressure Tubing • Aircraft Tubing

Stainless Seamless and Welded Tubing • Stainless Pipe and Fittings

PETER A. FRASSE AND CO., INC. 74IA
17 Grand Street, New York 13, N. Y.

Please send me a copy of your latest Steel Tubing Inventory.

Name..... Title.....

Firm.....

Address.....

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EC&M Bulletin 1062 Type ZHS 2300 Volt Motor Starter in Type VIII enclosure for Class I, Group D hazardous atmospheric locations.

Photograph — Courtesy, Foster-Wheeler Corp., designers and constructors of this 48,000 barrels per day, 3-stage crude distillation unit.

EC&M STARTERS for 2300 Volt Motors HELP BOOST PETROLEUM PRODUCTION

● Oil immersion of the Type ZHS heavy-duty Magnetic Contactor in the rear tank of the starter permits making and breaking the main motor circuit under oil. The oil also keeps the mechanism well lubricated and corrosion protected—*eliminating the need for frequent inspection or maintenance*. The drain pipe with shut-off valve terminates at the front under the conduit connection box in which the overload relays are mounted.

EC&M Type ZHS Starters for *2300-4600 volt motors* are built in 50,000 KVA interrupting capacity and in the VALIMITOR (volt-ampere-limitor) style for use on power systems having up to infinite KVA.

Write for NEW BULLETIN 1062-D

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79th STREET • CLEVELAND 4, OHIO

Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
Carload ..... 7.65¢
Ton lots ..... 9.05¢
Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo ..... 94¢
Ferrocolumbium, 50-60%, 2 in x D, contract basis, delivered, per pound contained Cb.
Ton lots $3.50
Less ton lots 3.55
Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $2.67
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo $1.32
Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
10 tons to less carload 75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.31
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.40
Less ton lots $1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $167.00
Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered $2.50
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.
Openhearth $2.90
Crucible 3.00
High speed steel (Primos) 3.10
Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.04
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.03
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
Carload, bulk, lump ..... 11.00¢
Ton lots, bulk lump ..... 11.50¢
Less ton lots, lump ..... 12.25¢
Vanadium pentoxide, 88-92% V_2O_5, contract basis, per pound contained V_2O_5 ..... $1.30
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
Ton lots ..... 21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
Carload, bulk ..... 6.60¢

Boron Agents

Contract prices per lb of alloy, del.
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B $4.35
Bortam, f.o.b. Niagara Falls
Ton lots, per pound ..... 45¢
Less ton lots, per pound ..... 50¢
Carbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed.
Ton lots, per pound ..... 10.00¢
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots $1.20
F.o.b. Wash., Pa.; 100 lb, up
10 to 14% B ..... .75
14 to 19% B 1.20
19% min. B 1.50
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.
No. 1 ..... 92¢
No. 6 ..... 63¢
No. 79 ..... 45¢
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.
Ton lots $1.44
Less ton lots 1.57
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.
Less ton lots $1.80
Silcaz, contract basis, delivered.
Ton lots ..... 45.00¢

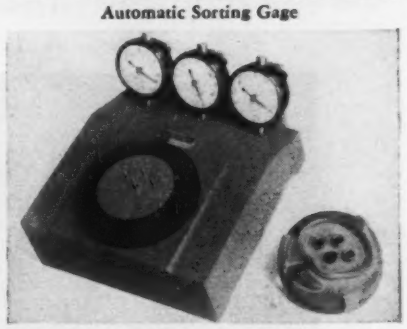
NOW,
not later —
is the time to gage-up
with INDICATING GAGES

Now, while you are getting set to produce government contract work, consider dimensional control gages. Beginning right now, is when you'll need to make workpieces *right the first time.*

New tools alone won't assure quality production or high output. Nor will old-type gages tell you how you're doing before it's too late. Old-type gages are merely "second-guessers" — they weed out the bad pieces from the good. Modern Federal Indicating Gages show you what's up ahead. They point out production trends so you can remedy machine set-ups and tool settings *before* production goes scrap-happy.

Indicating Snap Gage Model 1000 Series

Automatic Sorting Gage



Multiple Depth Gage Model 247 B-174

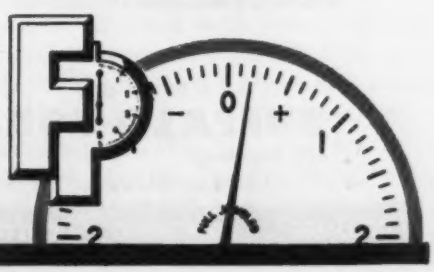
Here's what you get when you gage-up with FEDERAL Indicating Gages:

1. Federal offers all types of gaging systems: mechanical, electrical, electronic, and air.
2. Federal offers the most complete variety of Dial Indicators, Dial Indicator Gages, Multiple Inspection Gages, Continuous Measuring Gages, and Automatic Sorting Gages for dimensional control of any type of product.
3. Federal offers the benefit of experience gained in designing over 20,000 Indicating Gages . . . for all types of dimensions and for all classes of industries.
4. Federal offers a nationwide sales engineering organization — ready to serve, ready to help you get the right gage for your requirements.

Write today, giving complete details of your present or projected dimensional control problems. Federal Products Corporation, 1311 Eddy St., Providence 1, R. I.

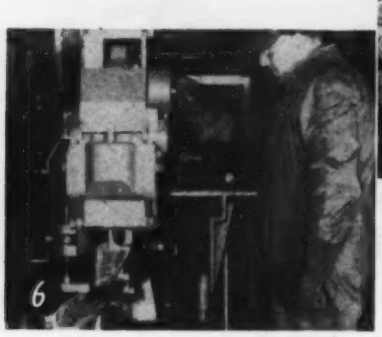
FEDERAL

Largest manufacturer devoted exclusively to designing and manufacturing *all types* of DIMENSIONAL INDICATING GAGES



DOING A *Day's* WORK IN *One Hour!*

THIS "Buffalo" UNIVERSAL IRON WORKER



(1) PUNCHING HOLE 13/16" through ⅜" flat iron

(2) CUTTING 45° CORNER off ⅜" flat iron

(3) CUTTING ANGLE IRON 3/16" x 2½" x 3"

(4) CUTTING 1" ROUND BAR

(5) CUTTING 2¼" x 4" SLOT

(6) STRIPPING a piece of angle iron from 3" to 2½"

A well-known Colorado railway shop (name on request) now does in one hour with its "Buffalo" Universal Iron Worker what formerly took a day with torches!

That's an example of how the U.I.W. speeds up the work, not only in railway shops, but in heavy industries as a whole, on both repair and straight production work. Here's a machine that can do up to five operations without tool changes—punching, shearing, cutting, notching and coping.

TRANSLATE THIS INTO THE EXTRA TURNOUT AND EXTRA PROFITS a "Buffalo" U.I.W. could put into your fabrication operations! Let us mail you complete information on the full line.

Write for Bulletin 360-D

"Buffalo" MACHINE TOOLS

BUFFALO FORGE COMPANY

492 Broadway Buffalo, New York

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING CUTTING SHEARING BENDING

Zinc Mine Extension Planned

Birmingham—A program to modernize and substantially increase production of the Jefferson City, Tenn., zinc mine of the Universal Exploration Co. has been announced by Robert Gregg, president. Universal is a subsidiary of United States Steel.

Shafts will be extended and another hoisting shaft sunk, Mr. Gregg said. Mill capacity will be increased and additional concentrating mill equipment will be installed. The zinc concentrates produced are shipped to Donora, Pa., for smelting by the American Steel & Wire Co., another U. S. Steel subsidiary.

Awarded "Star of Solidarity"

San Francisco — The Star of Solidarity of Italy, one of the highest of Italy's decorations, was awarded to Howard B. Barr, personnel manager of Columbia Steel Co., this city, for "his contribution to the country's reconstruction." He served during 1944 and 1945 as deputy to His Excellency Myron C. Taylor, presidential envoy to the Vatican.

New Bridge Ramp Patent Issued

Newark, N. J.—Patent for a "One-Man Bridge Ramp" with load capacity of 15,000 lb designed for use with fork lift trucks on railroad sidings has been issued to Harry Diamond and assigned to Elizabeth Iron Works, Inc. Developed originally for the U. S. Navy, the ramp is built in sizes to span gaps from 5 to 58 in. with differential heights to 7 in.

GIFS Awarded Certificate

Cleveland—Gray Iron Founders' Society was awarded a certificate of merit by the American Trade Assn. Executives, Washington, D. C., for distinguished services by trade associations. The certificate is an annual award presented for outstanding accomplishment by ATAE to national, state, or local trade associations.

If you use chain in your products . . .

ROUND will help you manufacture more economically... will boost your sales!

THE·OLDEST·NAME ROUND IN CHAIN

Regardless of the type of chain you use in manufacturing your products . . . whether it's Proof Coil, Super Steel or Conveyor, Double Jack or Safety, or any of a hundred other kinds of chain . . . *specify ROUND!*

Six large plants with warehouses in principal cities guarantee that your needs will be met promptly and efficiently. ROUND chain engineers will be glad to consult with you and to make recommendations that will cut your costs and speed up your assembly work.

Also—when you specify ROUND CHAIN, you secure an "extra bonus" which gives you a decided sales advantage in today's competitive markets. This bonus is public confidence in the ROUND name.

ROUND has stood for top quality in chain since 1869. Your customers know the ROUND name. Their customers, in turn, know and trust it.

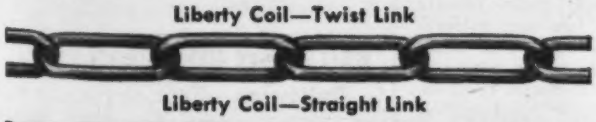
Manufacturers, who feature the ROUND name on their products and include it in their advertising and sales promotion, agree that it is a real aid to sales.

You, too, can benefit by this prestige, born of over 80 years of fine chain craftsmanship. Specify ROUND on every chain order.

A-2081

Proof Coil or BBB Coil

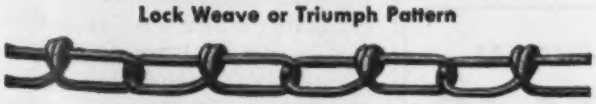
Liberty Coil—Twist Link



Liberty Coil—Straight Link

Liberty Machine—Twist Link

Lock Weave or Triumph Pattern



Buckeye or Brown Pattern

CLEVELAND CHAIN

The Cleveland Chain & Mfg. Co.

Cleveland 5, Ohio

ROUND Associate Chain Companies

The Bridgeport Chain & Mfg. Co., Bridgeport, Conn. • The Cleveland Chain & Mfg. Co., Cleveland, Ohio • Round California Chain Co., So. San Francisco and Los Angeles, Cal. • The Round Chain & Mfg. Co., Chicago, Ill. • Seattle Chain & Mfg. Co., Seattle, Wash. • The Southern Chain & Mfg. Co., Birmingham, Ala. • Woodhouse Chain Works, Trenton, N. J.

a *Balanced* BARROW
for Forward-End Dumping!

★ *REINFORCED* FOR HEAVY-DUTY SERVICE!

This Sterling Wheelbarrow has a reinforced tubular steel frame with special steel nose shoe. Provides perfect balance for forward end dumping and extra strength for heavy duty service. Rugged construction includes V-shaped tray braces and 12-spoked steel wheel. Ideal for wheeling sand, scrap, castings, coal and other heavy bulk materials. Can be furnished with pneumatic or zero pressure wheel.

Write for literature.

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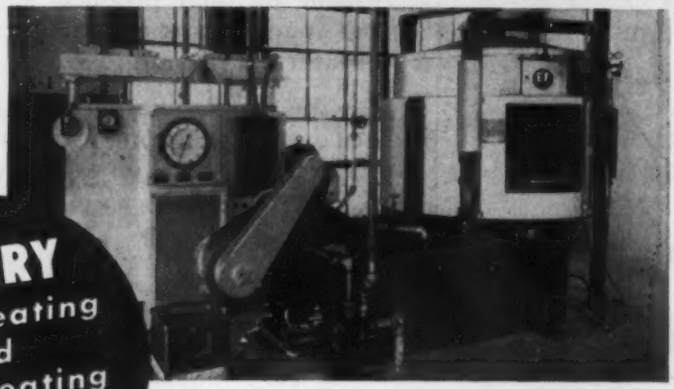
FOUNDRY EQUIPMENT
STERLING WHEELBARROW COMPANY • MILWAUKEE 14, WIS., U. S. A.

A 5377-½

EF



ROTARY
Heat Treating
and
Billet Heating
FURNACES

for any capacity requirement

The small inexpensive EF "Pan Dumping" rotary furnace pictured above, assures continuous, scale free and **uniform** heat treatment of bolts, screws, springs and other small parts. It has capacity for 250 lbs. per hour—is equipped with quench, atmosphere generator and automatic controls.

Other types of EF Rotary furnaces with capacities to 35,000 lbs. per hour or more, are used for heating ferrous and non-ferrous billets, and many other heating and heat treating processes.

Let EF engineers, with their wide experience in all phases of heat processing, work with **you** on **your** next job.

Gas-Fired, Oil-Fired EF *and Electric Furnaces*
for any Process, Product or Production
THE ELECTRIC FURNACE CO.
WILSON ST. at PENNA. R. R. *Salem - Ohio*

Tungsten Output Enough for Peace

Latrobe, Pa.—World production of tungsten is enough to meet maximum needs unless there is a mechanized war, said Roy C. McKenna, chairman and president of Vanadium-Alloys Steel Co., in his report to stockholders.

Any shortage of tungsten, Mr. McKenna said, will be artificial and due entirely to Government stockpiling.

Stockholders were told that the company's backlog of unfilled orders is heavier than ever before in peacetime. In the fiscal year ended June 30, the company earned $858,849 as against $956,091 a year ago. Sales were $8,557,512 and $10,172,959, respectively.

S.A. Sugar Mill to Get Turbines

Harrison, N. J.—Seven steam turbines designed for direct gearing to rolls will be supplied by **Worthington Pump & Machinery Corp.** for installation in a new sugar mill of Refinadora Paulista, near Sao Paulo, Brazil. The mill is being designed and built by Fulton Iron Works Co. of St. Louis.

Rivet Dimensions Changed

New York—A revision of the American standard for rivets of ½-in. nominal diameter and larger has been approved by the American Standards Assn. Major dimensional changes apply to pan-head rivets which were revised to conform with American Bureau of Shipping and U. S. Navy design.

B&O Orders 4000 Hopper Cars

Baltimore—Four companies will share an order for 4000 50-ton steel hopper cars placed by Baltimore & Ohio R.R. Co., according to an announcement by Col. Roy B. White, president. The contracting companies, each to build 1000 cars, are: American Car & Foundry Co., General American Transportation Corp., Pullman Standard Car Mfg. Co., and Bethlehem Steel Co.

"Good luck on our worst job"

HOW DAKE HYDRAULIC WORKHEADS SOLVED A DIFFICULT PRODUCTION PROBLEM

The manufacturer of an automobile attachment (name on request) has to blank, punch, and form 61 ST-6 sheet aluminum —mostly .081 to .125 of an inch thick. Crimping and making sharp U-bends in such material is a difficult job, at best.

To facilitate his production, he mounted two 50-ton air-hydraulic Dake Workheads on a frame and table of his own contrivance, and made up a die similar to those used in aircraft manufacture.

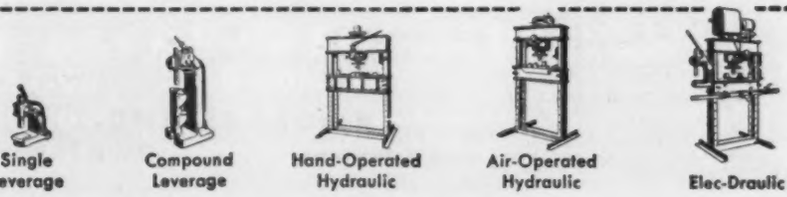
With this very moderate investment, he now does a really beautiful forming job on metal that is not easy to work. He writes, "We have just completed installation . . . and are having very good luck with our worst forming job."

This is another example of how ingenuity in the application of Dake Presses can improve production and reduce costs. An illustrated folder describes Dake Presses —send for a copy, today.

Write for this folder

Dake Engine Company, 602 Seventh St., Grand Haven, Mich.

DAKE
arbor and hydraulic
PRESSES



Single Leverage | Compound Leverage | Hand-Operated Hydraulic | Air-Operated Hydraulic | Elec-Draulic

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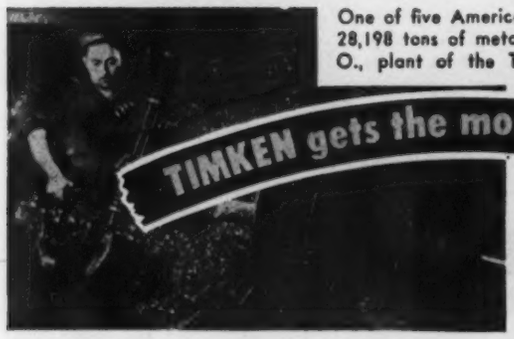


One of five American #3800 Crushers used to process 28,198 tons of metal turnings last year at the Canton, O., plant of the Timken Roller Bearing Company.

TIMKEN gets the most out of scrap

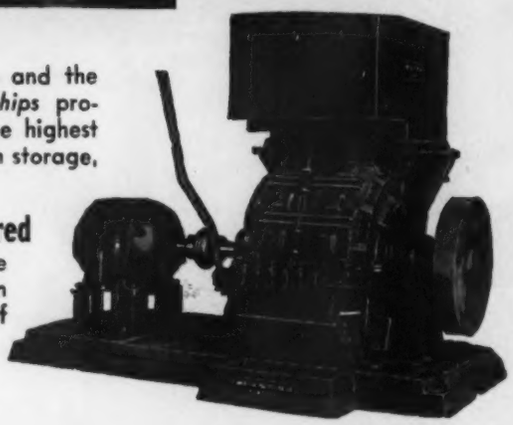
...with AMERICAN METAL TURNINGS CRUSHERS

1. Scrap Value Increased

Scrap prices are climbing — and the more uniform *short shovel chips* produced by Americans bring the highest scrap prices . . . save money on storage, handling.

2. More Cutting Oil Recovered

Cutting oil reclamation can be increased to 30-50 gallons/ton when long, curly turnings of steel, alloys, brass, aluminum, etc., are American-reduced and washed.



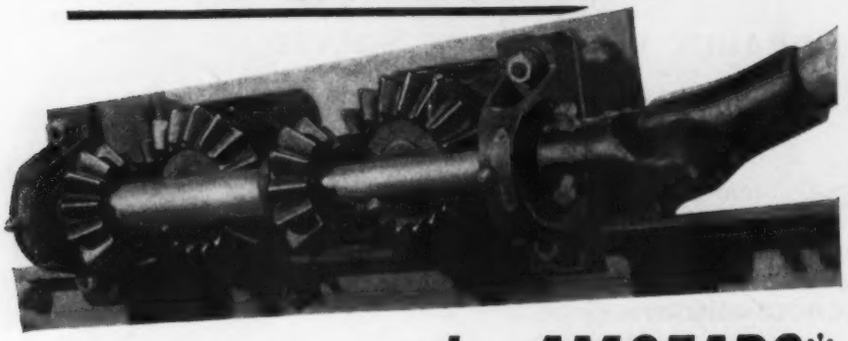
Write for complete details

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1439 MACKLIND AVE.
ST. LOUIS 10, MO.

Gear Teeth FORGED!



by AMGEARS*

Precision FORGED-TOOTH gears eliminated failures of cast-tooth, cast-iron gears on the heavy duty material loader drive shown above. Costs were 50 per cent less than for commercially cut gears.

If you use gears for bevel differentials, farm machinery drives, construction and road machinery or similar slow speed applications, it will pay to investigate FORGED-TOOTH gears. Send blueprints or samples of gears you are now using for comparative application, performance and cost analysis.

* AM . . . *Accurately Made*

AMGEARS, INC.

6633 W. 65th Street — Chicago 38, Illinois

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Critical Lack of Engineers Seen

Evanston, Ill.—An alarming shortage of trained engineers faces the United States, according to the American Society for Engineering Education.

Of the 26,500 freshmen entering engineering schools this year, a figure 27 pct below last year's and 20 pct below enrollments at the start of World War II, about 13,000 will graduate in 1954, less than half normal peacetime requirements, the survey shows. The 1949 record class of 50,000 graduates has been absorbed by industry, and the Secretary of Labor has listed all branches of engineering as critical.

Roofing Company Plans Expansion

Birmingham—A building program to add 60,000 sq ft. of floor space to its present plant has been announced by Southern States Iron Roofing Co. When new facilities are available the company's product list will be expanded to include aluminum and galvanized steel sheet roofing, shingles, siding, metal trim, steel fence posts, prefabricated chimneys, and an all-metal prefabricated outhouse.

Pitt-Shawmut to Rebuild Hoppers

Kenton, Ohio—An order for rebuilding of 200 hopper cars has been placed with International Railway Car & Equipment Mfg. Co. by Pittsburgh & Shawmut R.R. It is estimated by C. W. Benz, of International, the rebuilding will require 800 tons of steel compared with 2800 tons required for building new cars.

Receives "Oscar of Industry"

New York—Phil Huber, president of Ex-Cell-O Corp., has been awarded the "Oscar of Industry" for the best annual report of the machine tool industry. The Ex-Cell-O report was selected by the board of judges of the Financial World from more than 5000 submitted.

For Figuring High Temperature Applications of Stainless Steel...

ELEVATED TEMPERATURE PROPERTIES

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Titanium Stabilized Austenitic
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	TEMP. °F	STRESS-PSI
Creep: 1%—10,000 hrs.	1100	16,000
	1200	11,000
	1300	7,000
Stress for Rupture in 1000 hrs.	1100	32,000
	1200	21,000
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A.I.S.I. type 321

Titanium stabilized stainless steel offers many competitive advantages at a substantial saving in cost compared to other types of stabilized stainless. The excelient high temperature properties, shown here, are an example. Alloys of Titanium used in making type 321, are made at Niagara Falls from U.S. ores. This assures the user a plentiful supply of type 321 stainless steel.

TAM does not make or supply steel of any kind. But, as developers of titanium alloys such as 25% and 40% Low Carbon Ferro Titanium required in making 321, we can furnish much worthwhile data. Write our New York office.

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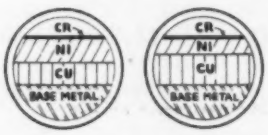
HOW TO EASE
METAL SHORTAGE HEADACHES

Here are three ways you can ease the production pinch caused by shortages in metal finishing materials:



Copper can save nickel

Where your specifications call for plating copper and nickel prior to chromium, a decrease in the thickness of nickel with a compensating increase in copper will still give you a product with good corrosion resistance. Unichrome Pyrophosphate Copper Plating Process is especially suited for this job, since it yields a smooth, fine-grained dense deposit that needs little buffing, if at all.

Conserve chromium while increasing output

Hundreds of companies using Unichrome S.R.H.S. Chromium Solution have been benefiting by high speed chromium plating. Today, with shortages, this bath is all the more valuable in sustaining production. Since more dilute S.R.H.S. baths can be used, appreciable amounts of chromic acid are conserved. One company, in fact, saves as much as 25%.

Where it pays to cut plating thickness

All-metal finishes supply best wear resistance. But in many cases, where products are plated mainly for appearance and don't get much handling, a thinner deposit followed by application of a clear Unichrome lacquer or synthetic will do the job. The result: You save metal supplies and still turn out a high quality product.

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• News of Industry •

Sells Chromic Acid Business

Cleveland — Purchase of the chromic acid business of the E. I. du Pont de Nemours and Co., Wilmington, Del., has been announced by Diamond Alkali Co.

The product will continue to be manufactured by du Pont at its Philadelphia plant, and under the terms of the sale, Diamond will take over distribution on Jan. 1, 1951. The chrome-plating field, primarily through the demand from the automotive and appliance industries, is the principal customer for chromic acid. Diamond is a major manufacturer of sodium bichromate, an essential raw material used in the manufacture of chromic acid.

Synthetic Rubber Plant Opens

Port Neches, Tex.—The all-purpose synthetic rubber plant here, one of the first to be reactivated under the government's expanded rubber program to meet rising civilian and military demand, started production recently. Expected to produce 72,000 long tons annually, the plant will start at a slow pace, producing 1500 long tons in October, and reach peak production of 6000 tons a month by Dec. 1. Engineers of the U. S. Rubber Co. thoroughly modernized the plant.

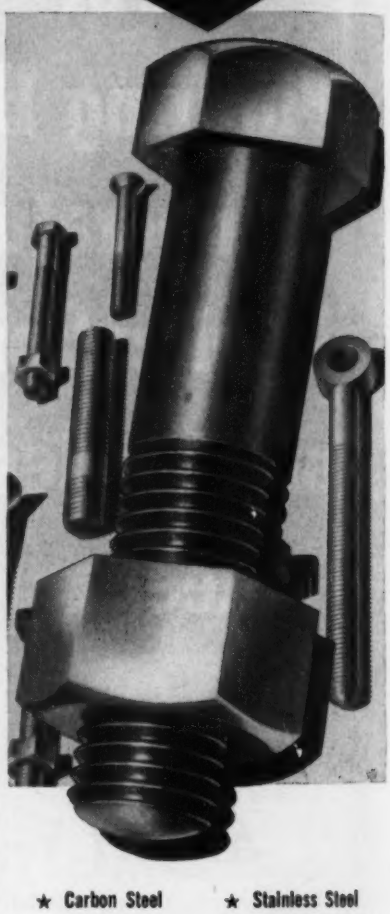
Ring Orders Increase Reported

Boston — Locomotive packing and marine piston ring orders booked by Hunt-Spiller Mfg. Corp. in September were up 334 pct compared to September 1949 and at a new high for any month since March 1945, F. W. Lampton, vice-president, reports. Ring orders for the first 9 months of 1950 topped the same period in 1949 by 14 pct.

Celebrate Golden Anniversary

Youngstown — Golden anniversary openhouse of Youngstown Sheet & Tube Co., marking 50 years in steelmaking, were held in the Indiana Harbor plants Oct. 11 and in the Youngstown district plants Oct. 18.

First for
BOLTS
NUTS
STUDS



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SUTTON 1½B STRAIGHTENER

Cap. 2½" Bars, 3" Tubes

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20" x 36", (Extra Rolls 16" x 48", 20" x 42") with Sealed Reduction Drive.

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4 Continuous Non-Ferrous Rod Benches suitable for Aluminum or Copper.

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26" United Engr. Co. — Fully Enclosed Geared Head, M.D., 9' 3" Centers.

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12 Spindle Moline Automatic Drill, capacity 180—⅛" holes, 36" Rotary Automatic Indexing Table.

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MODEL NO. 60, KANE & ROACH, WRAPPING TYPE, WITH 40 HP MOTOR. MACHINE SERIAL NO. 291784 ..... $2,750.00

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35,000 lb. Chambersburg Steam Drop Hammer. Bore of Cylinder 40" Diameter. Distance Between Vees 54". Built 1941—Excellent Condition

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NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Stockpilers Now Happy—Those dealers in the Cleveland area who stockpiled the right items last spring, when the bottom appeared to be falling out of both the machine tool business and the national economy, are sitting pretty at the moment. These dealers are now marking up the prices on these machines on the basis of their present buying prices.

Stocks in most dealers' warehouses are at low ebb. One dealer who usually stocks at least 400 machines is now down to 250 with no prospect for replacement. Dealers hope that the deliveries of new machine tools will mean the release of some machines to the used market. First possible benefit of this is expected in late fall, when machine tool builders get the production stepped up.

Push Older Machines—The unavailability of fairly new used machines, and the difficulty and expense of obtaining those which are available, are prompting dealers to put more sales effort into moving pre-1930 equipment. There are fairly good stocks of such machines available which the boom market has not yet seriously dented. However, (See THE IRON AGE, October 26, p. 126) dealer sources are reporting an awakening of interest in such machines.

The big hope is that the defense program, when it gets into full swing, will require a substantial volume of sub-contracting by small shops. According to dealers, pre-1930 machines will perform a great variety of sub-contracting work in acceptable fashion for small shops. It is hoped that a greater market for these machines will thus be created.

Inventories Down—Late type used machinery is fast disappearing from the Chicago market. Inventories are down to a bare minimum and dealers are doing a lot of trading among themselves. Owners of manufacturing plants in the area are holding off selling their old or surplus machinery in the hope of getting higher prices as the market becomes tighter. Some are also holding machinery in reserve in the expectation that government orders will cause them to be put back in service. Some companies have issued orders freezing excess equipment.

Dealers are jumping prices as the new machine tool prices are raised. Although able to sell from inventory at good prices ranging from $200 to $300 within the price of new machines, they are having a hard time replenishing their inventories. Older equipment is not moving too fast. However, some dealers are buying up old types of machines for speculative purposes.

Price Trend Upward—Used machinery dealers in Detroit indicate that some of the nervousness exhibited by the market a month ago seems to be dissipated. While far from stable, prices are more orderly. Buyers of most lines of equipment are adopting a more restrained buying attitude. Comparatively new equipment is still very much in demand, the trade reports. Many buyers who would not consider older machines a few months ago are now reported to be buying them.

With a decreased volume of machines available through auctions and sales of surplus and a much stronger demand, dealers with few exceptions report they are forced to do business today with a much reduced physical inventory. However, the upward price trend has carried dollar inventories up to levels that were never anticipated for the present number of machines on hand. Most in demand today are standard toolroom and production machines including lathes, grinders, milling machines, jig borers, presses and similar items.